AUGUST 23, 1958
VOL. 155 — NO. 8

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

FAIR EXHIBITS POPULAR

Telephone exhibits at fairs and expositions are proving to be popular and good public relations builders. Here Lowell Moore of Grand River Mutual Tel. Corp. of Princeton, Mo., watches subscriber make free toll call won at recent North Central Missouri Fair.

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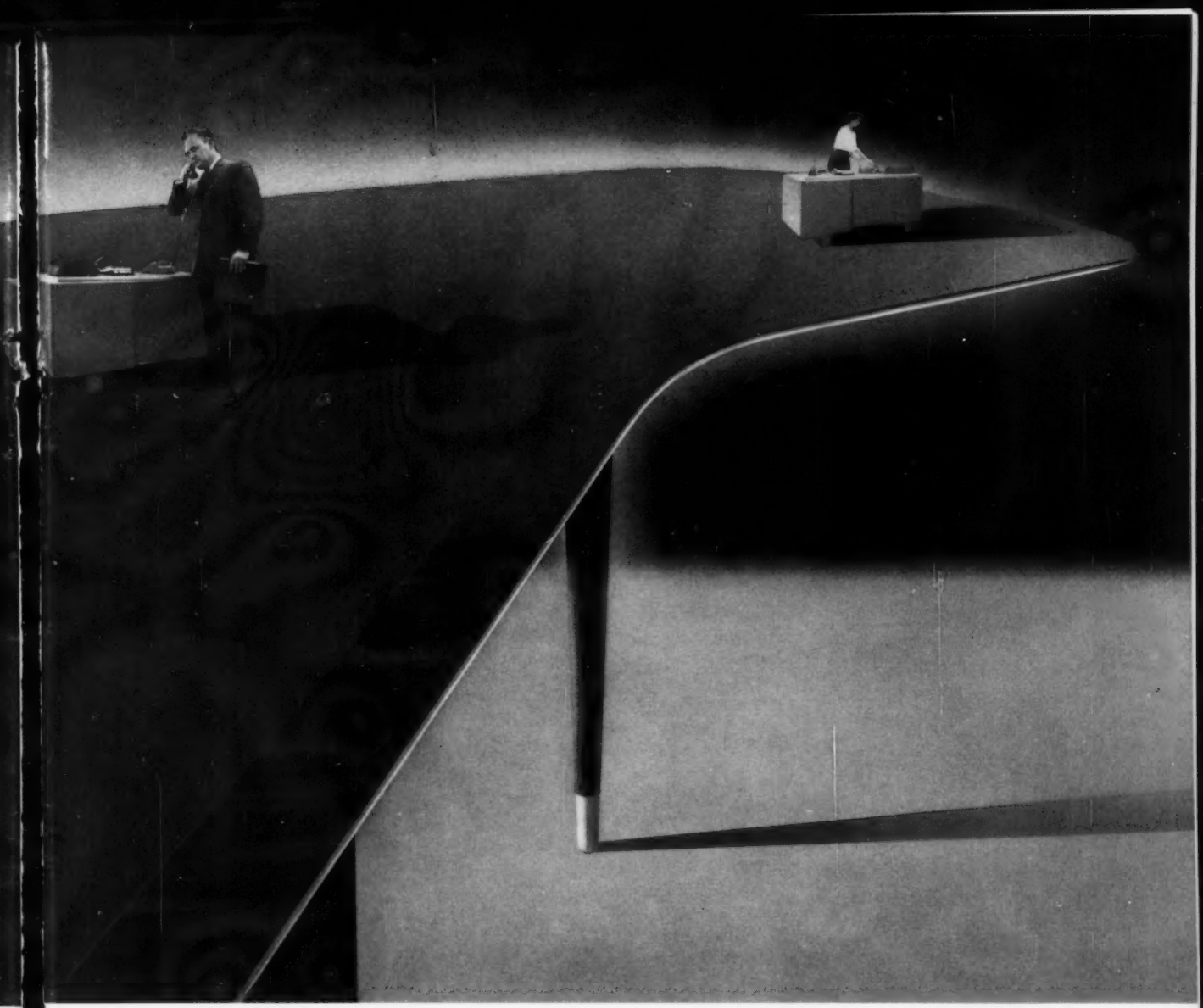

those in use. The "1573" phone is one of many profit-boosting items to give you extra revenue. It's a modern "500" type phone available in gray or black with new lucite finger wheel. Consult your Stromberg-Carlson representative for ordering information.

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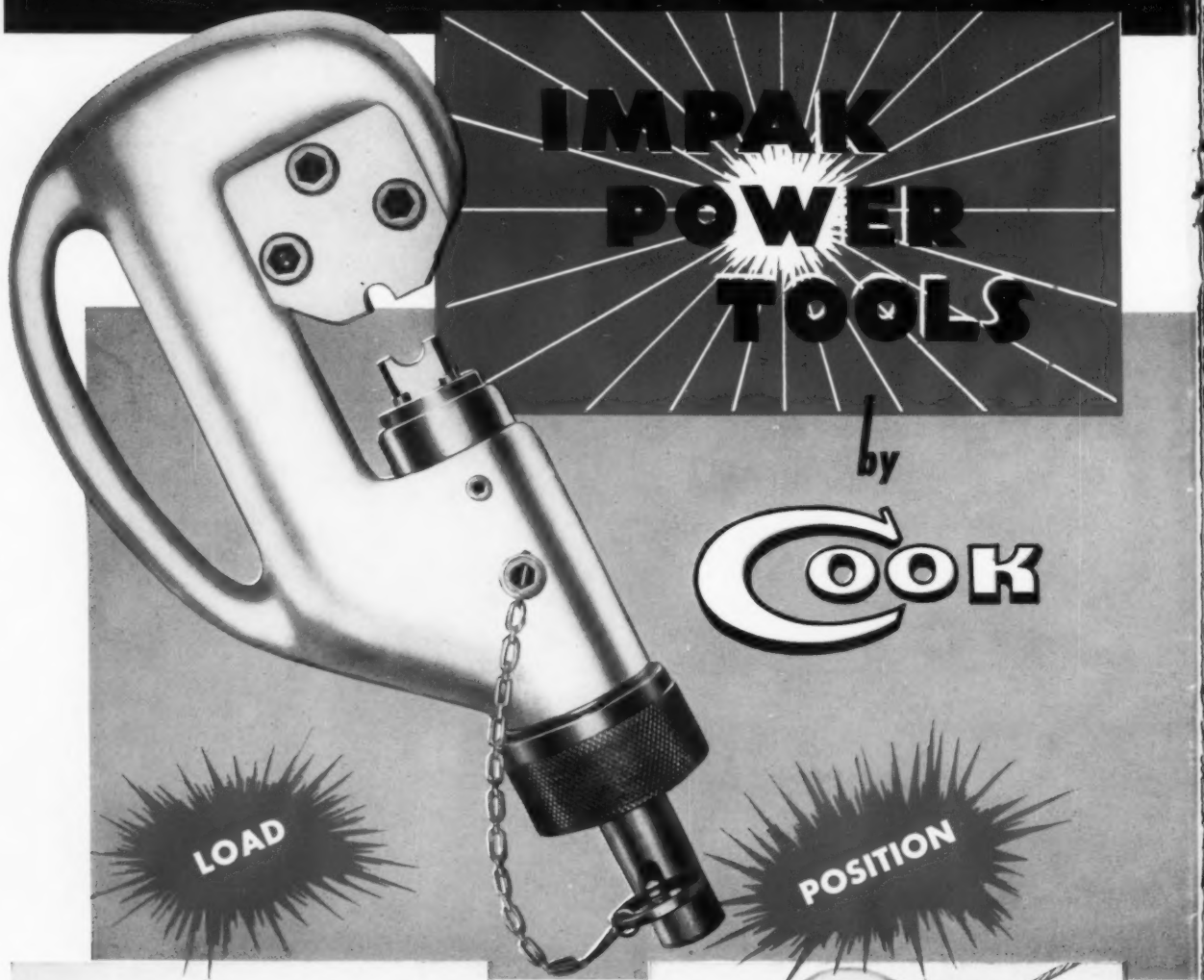

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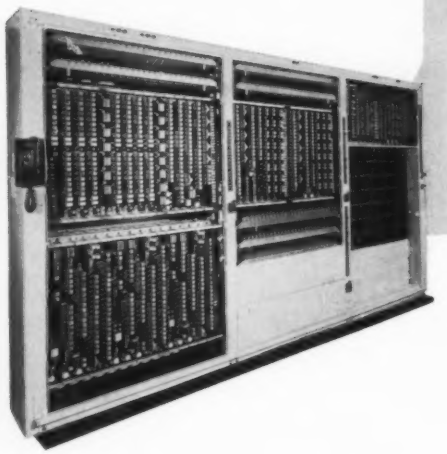

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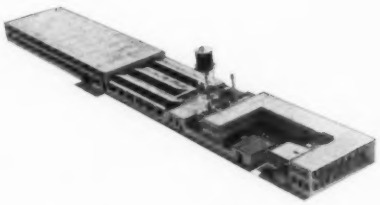

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FLASHES AND PLUGS

FROM THE MOUTHS OF BIRDS! As many a would-be orator has learned—after learning grammar, diction, and other arts of speech—what counts isn't so much what words you know as what use you can put them to.

Pretty Pol has done pretty well on the cracker barrel. And we have a soap-box-minded friend who says he is teaching his budgereegah to invoke the Fifth Amendment.

But this sort of thing, too, many be pure parrotry. What we'd like to see is a bird whose chatter shows as much sense as a homing pigeon's silent mastery of direction.

Well, at least we have now read of one. His name is Jerry. He goes places as do other birds, but then talks his way home.

Having left Kansas City and flown 25 miles to Shawnee, Kan., he made friends with a grain company officer (not a bad idea for a hungry bird), and for the next few days kept the conversation casual, as you might say.

But suddenly he seems to have tired of pleasures and palaces, and home was a long way and—where? "Call Mary Neal, Jackson 3-4312," he requested of his hostess, who did so, and all was forgiven.

Now, there are two ways of looking at Jerry's achievement:

(1) With the probably depreciative eye of the professional homing pigeon who is against nonunion competition, and

(2) From the point of view of any bird (including some we know) who holds that a parakeet would be a "pigeon" (see Webster, under slang) to fly all the way home when he could arrange a lift by telephone.—*Christian Science Monitor.*

•

A LIKELY STORY. Shocked by the language used by two linemen repairing telephone wires near her home, an old lady reported the matter to the company. The foreman in making his report on the incident wrote:

"Me and Bill was on the job. I was up the pole and let some hot lead fall which went down Bill's neck.

"He turned to me and said, 'You really must be more careful, Harry,' and I said, 'Indeed I must, Bill. I will see that it don't happen again.'"

•

A WORD TO THE WISE. Two sisters' conversation in Pasadena, Tex., was punctuated by someone on their party lines jiggling the receiver, obviously encouraging them to hang up.

"Do you suppose someone on your line is rude enough to do that?" one sister asked.

"Heavens, no!" exclaimed the other, "That must be on your line. All my neighbours are very civilized people."

That was months ago. Neither has heard a jiggle since.

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

August 23, 1958

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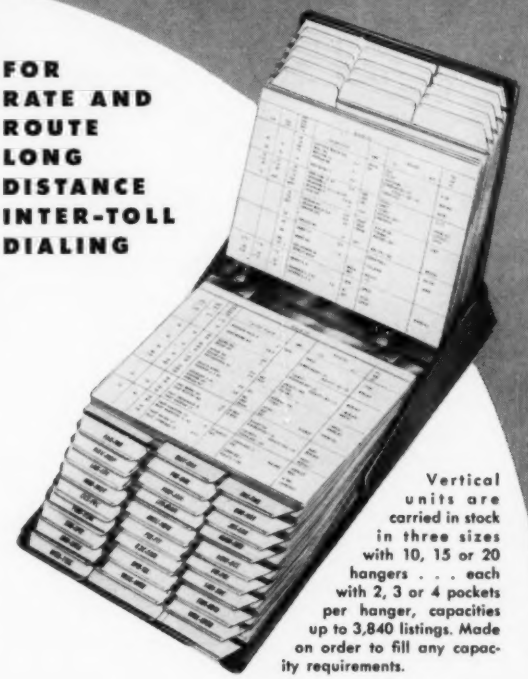

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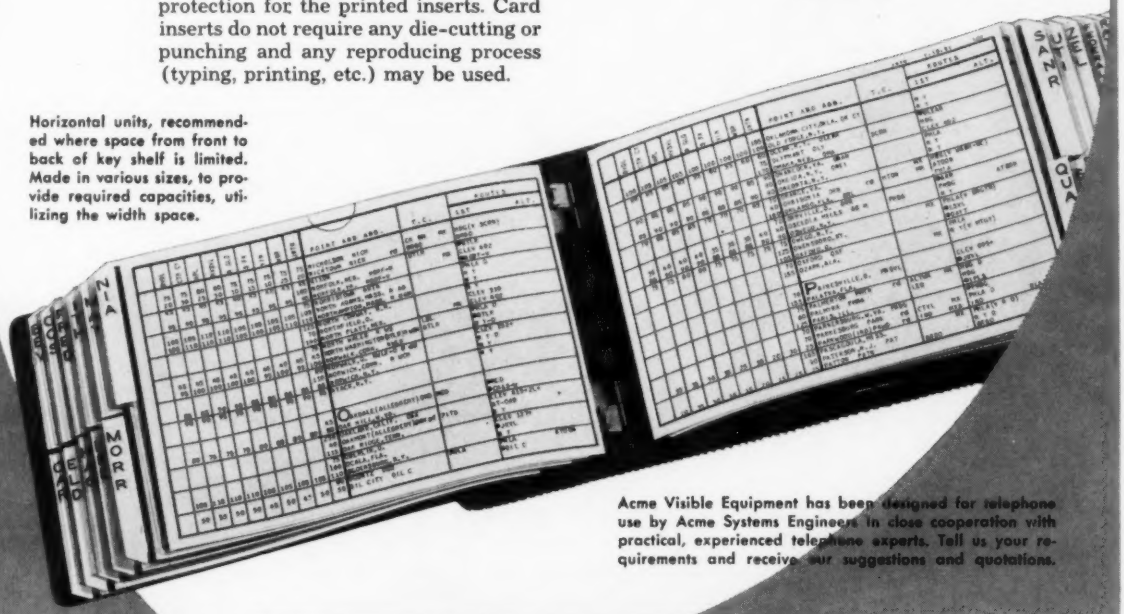

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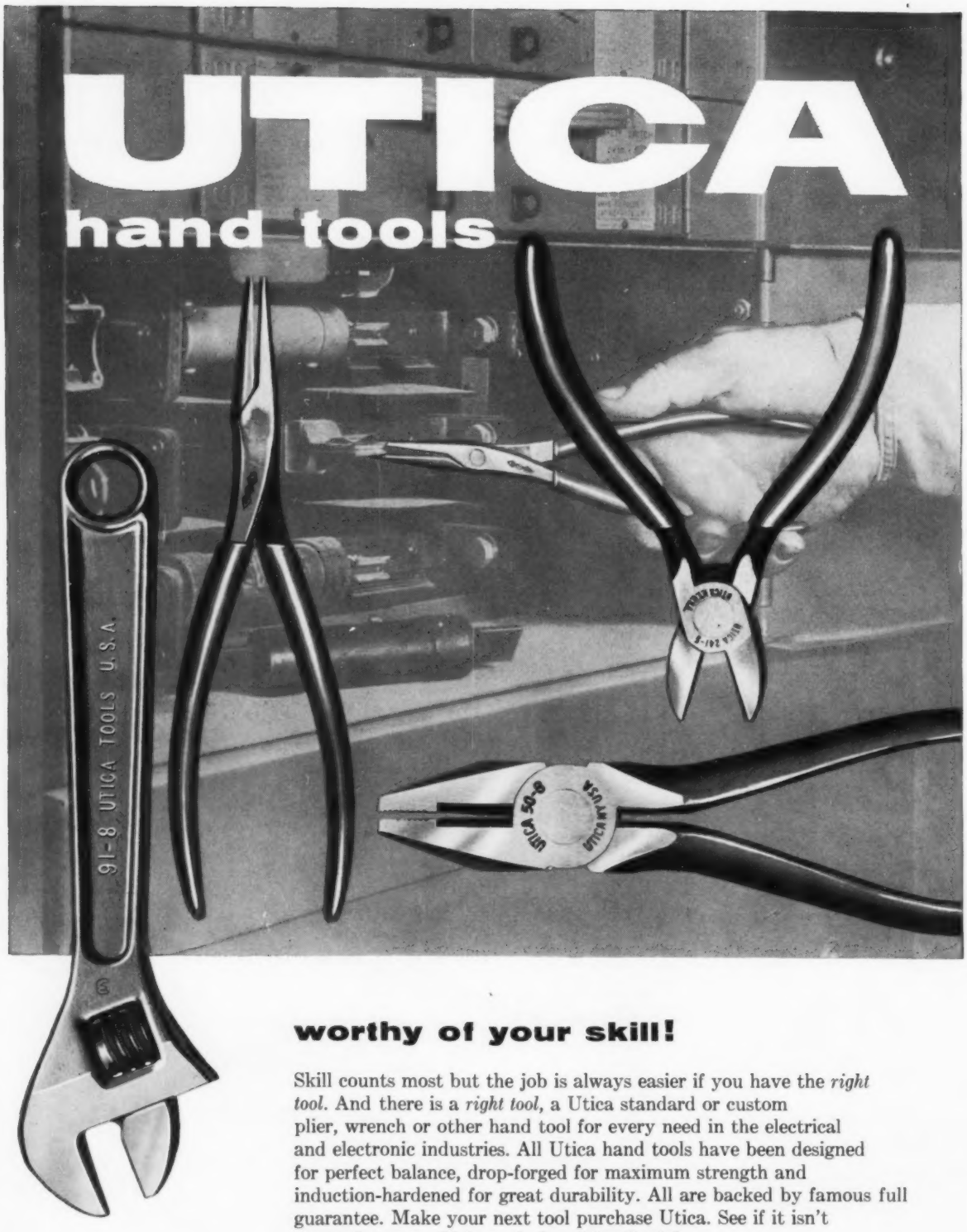

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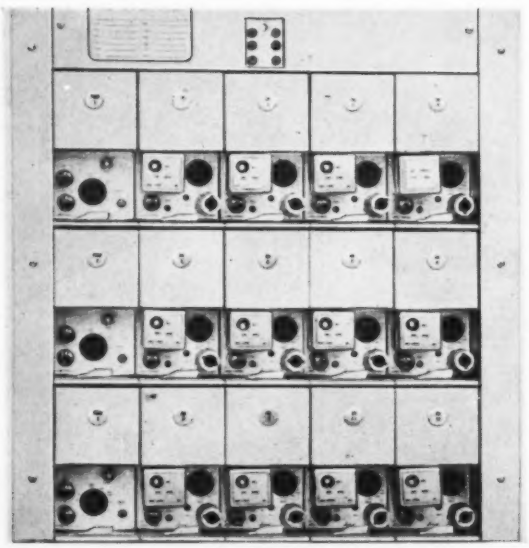
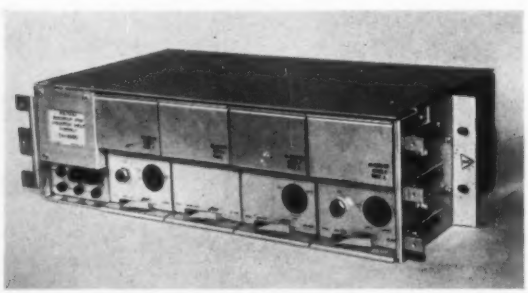


Typical Lenkurt 45-Class Basegroup Channel Bank provides channelizing and grouping equipment for 12 voice channels, yet occupies only 22¾ inches of vertical rack space. Type 45C Carrier provides for economical expansion in 4-channel groups by the simple addition of interchangeable plug-in units.



Lenkurt Basegroup Transfer-Converter permits transfer of 12-channel groups between Lenkurt 45-Class systems and Western Electric J, K, L, or CCITT conforming systems. It eliminates expense of extra channelizing equipment—permits different carrier systems to be connected in tandem without demodulating the individual carrier channels to voice frequency.

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Lenkurt Microtel Type 74A takes less floor space—requires smaller antennas—uses fewer tubes—consumes less power! A single terminal can accommodate 4 to 240 channels; system can be expanded to 960 voice channels, plus 64 supervisory, remote-control or telemetering channels, *without additional antenna equipment.*

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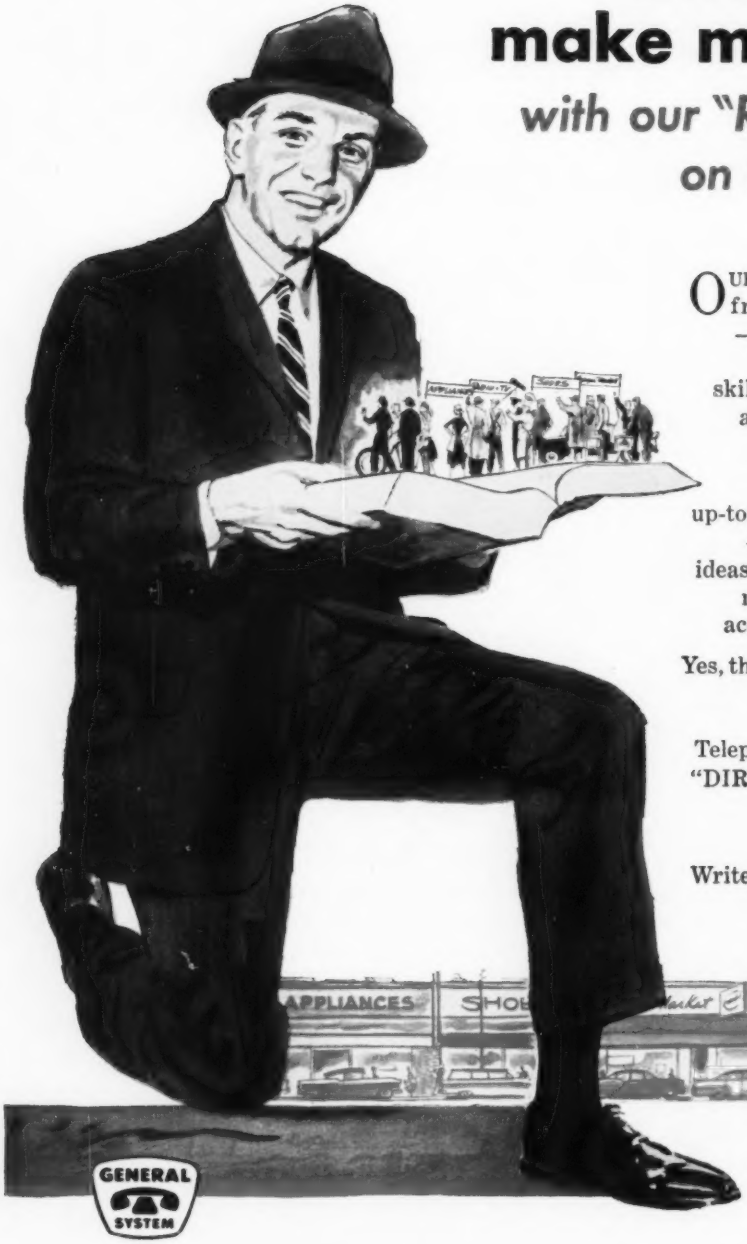

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Congress gives excise tax relief on luxury items but ignores levy on telephone service. FCC refuses to change order reserving 890-940 megacycle radio frequency bands for government's use. Congress gives small business tax relief. Reorganization of REA held unlikely in this session of Congress.

CONGRESS last week continued to ignore the nation's telephone subscribers in considering a general overhaul of federal excise taxes. Although bills approved by the House and Senate contain some relief for a number of luxury items, both are silent with respect to the 10 per cent excise tax on telephone monthly bills and on long distance service which industry leaders have long argued is a necessity, not a luxury. The bills approved by Congress would ease the tax burden primarily on theater-goers, liquor distillers, and various manufactured items. The Senate defeated a proposal to reduce the present 27½ per cent depletion allowance on income from oil and gas production. Final approval by Congress on this measure was expected before adjournment.

The refusal of Congress to ease the telephone excise tax was due to a number of circumstances. The tax revision bill, as approved, does not eliminate in whole any important excise tax, but merely reduces a number of them. The telephone industry has been hopeful for outright repeal of the telephone excise tax, rather than a partial repeal that would tend to make it a permanent part of the nation's tax structure. Another alternative, still dormant, would put the telephone excise taxes on a certain expiration date without cutting or curtailing them immediately. Nothing is likely to be done about this at this session. Because it is a large source of federal income, Congress was not prepared to eliminate the entire tax. Furthermore, the Senate had previously defeated an attempt to reduce or repeal the telephone tax, so that no effort was made to bring the matter up again in the bill approved.

FCC Acquisition Rule Disputed

As might have been expected, the Bell System does not see eye to eye with the United States Independent Telephone Association (USITA) on the proposed FCC rule to require a hearing on applications by telephone companies to acquire other telephone property. Specifically, the FCC rule will require that any person or organization seeking a hearing on an application by a telephone company to acquire telephone properties submit a statement showing why the proposed transaction would *not* be in the interest of the public or the subscribers to whom service is to be rendered.

The Bell System was all in favor of this proposal. It puts the burden of proof on anybody *objecting* to a proposed acquisition of telephone properties. A statement filed with the FCC for the American Telephone & Telegraph Co. said that the requirement of a statement by anyone objecting to a telephone property acquisition would "tend to expedite the proceeding and concentrate the evidence on issues where there is no disagreement." The proposed rule would also extend from 30 to 40 days the time allowed for posting and publication of acquisition notices.

The USITA took the position that the proposed rule would exceed the statutory authorization of the FCC in acquisition cases. Furthermore, the USITA felt that the proposed rule would violate the legislative history of the Act of 1955, which requires a mandatory hearing in telephone acquisition cases only where requested by one or more closely affected parties.

The USITA suggested that the burden of proof be turned around in the other direction. It also urged that all acquisition applications to the FCC include a statement as to whether other telephone companies were interested in acquiring the properties and further details where there was such additional interest. This would serve to show whether other telephone companies (beside a proposed Bell System purchaser) was seeking to buy or make an offer.

FCC Stands Pat on Frequencies

The FCC has refused to reconsider its action of last April which reserved for government service a number of frequency bands in the radio spectrum, including the 890-940 megacycle area now used by a number of telephone companies. When the commission took its action of reallocating these fre-

USITA Convention Data

TIME: Oct. 12, 13, 14, and 15.

PLACE: Conrad Hilton Hotel, Chicago, Ill.

PROGRAM: General sessions; departmental conferences (REA borrowers' meeting, 2 p.m., Oct. 12); manufacturer's exhibits; annual banquet and dance; annual meeting of Independent Telephone Pioneer Association.

SPEAKERS: USITA and industry representatives and nationally known figures.

NOTE: There will be no convention registration fee. Advance registration forms may be obtained by writing the United States Independent Telephone Association, 430 Pennsylvania Building, Washington 4, D. C.

quencies last April petitions for reconsideration were filed by the USITA and 13 individual Independent telephone companies, as well as the Lenkurt Electric Co.

By way of explaining its refusal to go into this matter again, the FCC simply repeated its earlier statements that the military defense authorities had apparently earmarked these frequencies which had been requested by the Office of Civil and Defense Mobilization.

When the petitions for reconsideration were made to the FCC, the Office of Civil and Defense Mobilization promptly objected. It advised the FCC that granting these petitions would seriously restrict government defense functions and would "create uncertainties with respect to the use of the band between now and February, 1961, when present authorizations (on non-government users, who are being allowed to continue operating until then under restrictions) expire, and might well complicate the problem of eventual clearance of the band for the radio-positioning service."

General Wins in California

What caught the eye of a good many telephone and financial people in connection with the recent rate increase authorized for General Telephone Co. of California was the fact that the California commission went above 7 per cent in the return allowance. This is probably a record in recent years for a rather strict state regulatory commission. Specifically, the California commission authorized the General company to increase rates by $5,860,000 a year, which is estimated to yield a return of 7.1 per cent. This is in addition to a $2,230,000 multi-message unit rate increase allowed earlier in the Los Angeles extended area rate case.

But, probably the most significant feature of the General Telephone rate increase opinion was the refusal of the commission to go along with its staff's view that the General Telephone manufacturing and sales subsidiaries should be restricted as to profits, just as Western Electric Co. is treated in the Bell System rate case (Western Electric is, of course, the manufacturing subsidiary of the Bell System). But, the California commission found that there was no similarity between the Bell System subsidiary and the General Telephone subsidiaries because the General Telephone companies buy only 42 per cent of their supplies from the General manufacturing and sales subsidiaries. The commission opinion stated:

"The commission rejects the staff method of testing the reasonableness of the prices paid by General Telephone of California to its affiliates by computing the resulting return to those affiliates on a hypothetical rate base. The 'average net investment' (rate base) of manufacturing companies varies widely in relation to the volume of goods produced and sold, and sales companies ordinarily have a minimal 'average net investment.' The commission's primary concern, in protection of the public interest, is that prices paid by applicant for supplies and equipment be fair and reasonable. Profits made by an affiliate are important only as a factor in testing the fairness and reasonableness of prices charged by the affiliate to the utility. In this instance, the profit of applicant's affiliates calculated as a percentage on gross sales are, and the commission finds them to be, within the zone of reasonableness. This supports applicant's position as to the reasonableness of prices paid by it to its affiliates. . . .

"The evidence is equally conclusive that General Telephone's affiliates charge General Telephone of California the same or lower prices than said affiliates charge non-affiliated customers on the open competitive market. The record supports a finding, which we hereby make, that business done by affiliates with applicant was done on at least as reasonable basis, as applied to applicant, as all business done by these affiliates with all General Telephone domestic companies. In view of these facts, the commission finds that the prices paid to its affiliates by General Telephone Co. of California are fair and reasonable. Accordingly, the commission will not at this time adopt the adjustments made by the (Commission) staff."

REA Approves Two Telephone Loans

Almost 1,700 farms and other rural establishments will receive new or improved telephone service as a result of two loans approved during the week of Aug. 4 by the Rural Electrification Administration, the U. S. Department of Agriculture announced on Aug. 12. More than 1,100 of these subscribers will receive telephone service for the first time.

The loans, totaling $957,000, were approved to borrowers in South Carolina and Virginia as follows:

The Princess Anne Telephone Co., Inc., Pungo, Va., $302,000; Aug. 4.

These funds will enable the new borrower to improve service for its 518 present subscribers and to furnish initial service for 342 rural families. The company is presently furnishing dial service through the Pungo exchange. Additional automatic facilities will be installed to handle the 342 new subscribers. A portion of these loan funds will be used to refinance the borrower's existing indebtedness incurred when the present system was modernized.

Kermit S. Land Sr. is president and manager of the Princess Anne Telephone Co.

•

Piedmont Rural Telephone Co-op., Laurens, S. C.; $655,000; Aug. 8.

These funds will be used by the borrower to provide facilities to serve 809 new subscribers in its present service area. Added facilities required include new and larger automatic facilities in the Laurens exchange where most of the additional subscribers will be located. Provision for an increase in the proportion of private and semi-private lines in each of the four exchanges is also included in the loan.

REA loans to the Piedment Telephone Co-op, amount to $1,536,000 which will enable it to furnish new and improved service to 2,746 subscribers. The completed system will consist of automatic exchanges at Enoree, Laurens, Gray Court, and West End. All exchanges are in operation serving approximately 1,500 subscribers.

J. W. Tinsley is president and J. S. Stoddard is manager of the Piedmont Rural Telephone Co-op.

Small Business Tax Relief

Last week in this department there was reported the action taken by Congress in putting through a small business loan bill. This week there is a report of another step taken by Congress to aid small business, in the form of some measure of income tax relief.

But, first of all, it must be made clear that the small business loan bill, mentioned last week, is hardly likely to compete with REA in popularity as far as cheap money for rural telephone or rural electrification loans is concerned. In other words, REA is still operating at the old stand on the basis of 35-year loans at 2 per cent annually. The small business loan would permit 250 million dollars in government funds to be invested in small

(Please turn to page 65)

Buried Wire and Cable Construction

By RAY BLAIN

Part 1

FOR YEARS engineers have striven to provide serviceable telephone plant at a reasonable cost for use in rural and suburban areas. Through recent developments and improvements in wire and cable and in construction tools and methods, buried plant is making substantial progress toward reaching this objective.

We do not intend to infer that aerial plant is obsolete or that it should be replaced in every case by buried facilities. Neither do we advocate that all new facilities should be underground or buried. We fully realize that aerial plant will continue to prove economical and do a good job in wire distribution systems at many locations for some time to come. It is also realized that buried construction will not prove suitable in all areas because of the nature of the terrain, soil conditions, etc.

However, with the increasing trend toward underground construction, the following information may prove beneficial to operating telephone companies that are faced with plant rehabilitation, expansion, or extensions in the immediate future but are not fully aware of the latest experience with buried facilities. When aerial plant must be replaced as a result of obsolescence, overloading of the pole line, or because of public pressure, all types of underground construction should be carefully considered.

Advantages of Buried Plant

The advantages of this type of plant are numerous. First, it is free from exposure to the elements and is less subject to trouble and service interruptions. In general, it is less difficult to obtain a right-of-way for buried plant than for aerial lines. Tree trimming will be eliminated. The accident hazard to workmen will be materially reduced. Troubles due to forest and ground fires, falling trees and highway accidents are eliminated. The appearance of the plant is greatly improved and this is always worthwhile from the standpoint of the public relations of the operating company. When full advantage is taken of new and improved tools, materials and techniques, buried plant can usually be installed at a more rapid rate, under average conditions, than aerial lines. Where wire and cable can be plowed in, this type of construction will usually prove considerably less expensive than aerial facilities, both from a first cost and maintenance standpoint.

Disadvantages of Buried Plant

It must be admitted that buried facilities are definitely less flexible than aerial plant. Reinforcement of buried plant along the same route is likely to be costly and may be impossible because of space limitations. This results in a lower line-fill initially as more circuits must be provided than for aerial plant. "Foreign" workmen, on digging operations and highway grading and widening projects, may cause damage to buried lines. Soil erosion and washouts may also cause trouble, if wire and cable are not buried to a proper depth and adequately protected in vulnerable locations.

In other words, cases of damage occur less frequently to buried plant than on aerial lines, but are usually more costly to repair.

Armored cable or wire must be provided in gopher infested areas. The transmission losses in buried wire and cable are greater than on open wire, although noise levels are much lower.

LEFT: Princeton (Ind.) Telephone Co. uses this plow, manufactured by Hallenberger, Inc., to plow-in wire and cable. RIGHT: Crew of Frank Horton & Co., La Mar, Mo. contractor, plowing-in cable to restore service after sleet and flood damage.

In addition, fault locations and repairs are more difficult and more costly in buried facilities than in aerial plant. However, new developments are simplifying fault location procedures.

Improved Materials

The telephone industry has long been active in the development of wire and cable that will prove satisfactory for direct burial. To prove adequate for this type of construction, wire and cable must be strong mechanically to avoid damage during installation and to withstand normal earth shifts, such as frost heaves, after installation. It must also be provided with a non-corrosive shield adequate to obtain electrical protection and to prevent damage by gophers and termites.

It also has been necessary to develop suitable low-cost pedestals and terminal accessories to permit the splicing, loading and termination of wire and cable above ground where it will be free from exposure to ground moisture. This development has progressed rapidly, and there are on the market today low-cost pedestals and associated equipment.

New developments in plowing techniques and materials, plus sound engineering standards, now make buried plant a practical reality. Under favorable conditions, buried plant techniques can make systems, or parts of systems, possible at initial costs well below the cost of aerial plant with an indication of a substantial savings in annual maintenance costs, and with considerably less danger of service interruptions.

Construction Methods

Both cable plows and plowing methods have been materially improved during the past few years. A D-6 tractor, or its equivalent, having a draw bar pull of at least 8,000 pounds is generally required as a prime mover for one of these modern plows. Plows now available will bury wire and cable at controlled depths with a minimum of soil displacement. The narrow surface slot made by the plow may be closed by merely driving a heavy vehicle over it. A dual-tired truck is ideally suited to this operation and it restores the ground to practically its original condition.

Interior (left) and exterior views of pedestal terminal, developed by Utility Products Co., for underground construction.

Lower cost construction is generally obtained when wire or cable can be plowed in along the shoulders of roads. In some cases it has been plowed in the center of the roadbed on unimproved, graveled or oiled roads. If the work is properly performed, this plowing may be accomplished without damage to the road. Plowing across a private right-of-way and through fences and cultivated fields does not, in general, prove desirable. Road improvement plans for the future should be carefully investigated before any buried facilities are installed along highways. Usually, the best method of crossing hard-surfaced roads is to push pipe under them, then remove the pipe and pull the cable through the remaining hole. Also, railroad tracks often may be crossed by this method.

Small trenching machines powered by gasoline engines and operated by one man in a manner similar to a lawn mower or powered garden plow can often be used to advantage in locations where wire or cable cannot be plowed in. These little machines will dig a ditch from about 3 inches to 6 inches wide and from 1½ to 5½ feet deep, at a speed of about 4 to 15 feet per minute, depending on the depth. The compact design of these trenchers facilitates going around obstructions and working in close quarters so as to eliminate practically all hand digging.

The attitude of local and state highway departments is an important consideration in the proposed use of buried facilities. Without permission to bury wire and cable on road rights-of-way, the use of buried plant will probably not prove quite so economical.

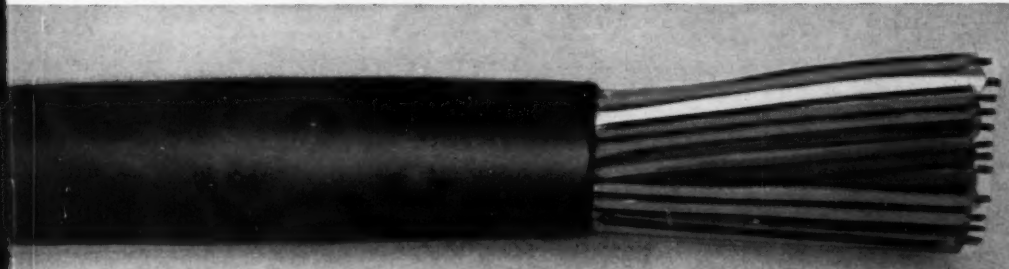
One-man Bus-Brown trencher, a product of Brown Mfg. Co.

Lightning Protection

There is indication that the Bell System and REA engineers are in general agreement in assuming that, for protection purposes, the surge dielectric strength between conductors and shield of buried facilities to be 20 KV for buried wire and 25 KV for buried cable. In buried plant the greater part of the lightning surges will be collected on the shields rather than in the core conductors, whereas with aerial plant the majority of the lightning surges are collected by the aerial

(Please turn to page 24)

THE MESSAGE IS: MONSANTO



OPALON 1101, "engineered" for primary insulation of switchboard cable by high resistance to cut-through, and excellent deformation resistance.

*your source for "engineered" **vinyl** telephone insulation compounds*

Communications wire and cable manufacturers like the "engineered" choice offered by the Monsanto Opalon series of vinyl compounds, designed and developed for individual application requirements.

For example: Opalon 1101, a semi-rigid vinyl compound for primary insulation of switchboard cable. Resistance to both cut-through and deformation: excellent. High gloss, smooth surface, great ease of extrusion, excellent heat stability and insulation properties, available in a broad range of colors.

Monsanto also offers a broad line of polyethylene insulating compounds. When you want a specific answer to an insulating problem, call in your local Monsanto representative. Write for complete technical data on Opalon vinyl compounds and polyethylene compounds to Monsanto Chemical Company, Plastics Division, Room 454, Springfield 2, Mass.

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SIMPLICITY OF DESIGN...

Telephone

Automatic Electric research and design engineers combine their talents to plan the simplest possible construction for Strowger Automatic equipment.

another reason why

Men Choose Strowger!

When purchasing central office equipment, the experienced buyer looks for a product that offers *minimum maintenance.* That's why so many telephone men choose Strowger Automatic. You see, Strowger operates on a step-by-step principle and is designed with the simplest possible construction. This keeps adjustments and repairs to a minimum. The position of the switching components permits visual tracing of circuit operation. This speeds your initial training of personnel and makes trouble-shooting quick and easy.

PROVE IT FOR YOURSELF! Visit a Strowger Automatic exchange. You'll see that Strowger offers unsurpassed simplicity in design. You'll also see the craftsmanship and quality construction of this famous equipment. Then get in touch with us. We'll be glad to help you in any way possible. *Write Automatic Electric Sales Corporation, Northlake, Illinois. Or, call Fillmore 5-7111.*

AUTOMATIC ELECTRIC

Subsidiary of **GENERAL TELEPHONE**

This one-man trencher—Pow-R-Spade—is manufactured by Stampings, Inc.

access can be had of all pairs for terminating, as required.

The pedestals have a mounting strip in the top that may be equipped with protected or unprotected terminal blocks. One-pair terminal blocks are available for buried wire and six-pair for cable.

Pedestals should be located on buried wire or cable runs as required for distribution, splicing, protection and loading. The use of a pedestal for connecting two sections of cable eliminates the need for the services of a skilled cable splicer. This also provides an ideal test point for all pairs in the cable.

Good engineering dictates that protected wire and cable terminal pedestals shall be provided so that no point on the buried run shall be more than 2,000 feet from a protector, including station protectors. Care should also be exercised to locate pedestals as near as possible to potential subscribers who may require service at a later date. This avoids the difficult and expensive

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wire extensions, which conduct the lightning surges directly into the conductors of the cable.

In non-severe lightning damage areas, the inherent dielectric strength of the buried facilities is relied upon extensively to prevent damage; consequently, the application of protective devices is held to a minimum. Specific protection measures applied to buried wire and cable installed in these areas are as follows:

Bond the shields of all buried wires and cables entering a central office to each other and to the central office ground.

Provide air gap lightning arresters and heat coils on all circuits entering the central office. (This is standard main frame protection.)

Provide a 22-gauge buried tip cable from the MDF in the central office to the cable trough, vault, or first pedestal location, and splice.

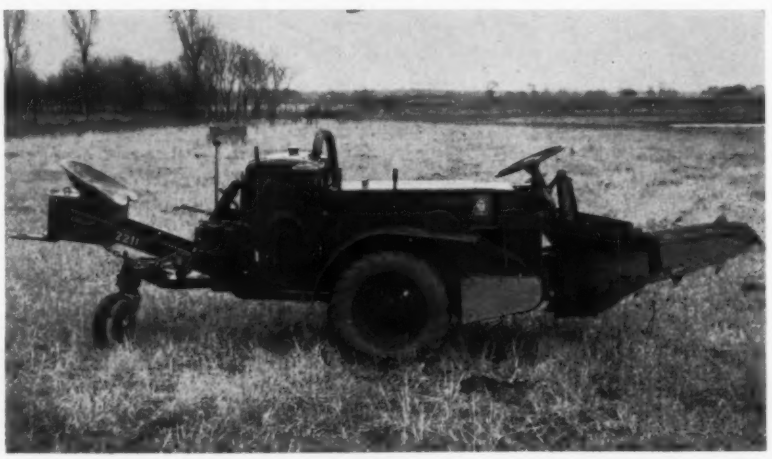
Provide a short section (not less than 4 feet) of No. 24-gauge conductor current limiting cable between the tip cables and the distribution cables.

It is preferable to extend the tip cables to the first pedestal location, wherever practicable. An additional pedestal can be installed adjacent to the first pedestal and the fuse cable run between the two pedestals and connected in each.

Pedestals and Terminals

Special terminals have been designed for either pedestal or pole mounting for use on buried facilities. The cable is looped through the terminal so that

Ryan Model C wire and cable layer.



Small trencher—Model 702-A—designed and manufactured by Barber-Greene Co.

Transmission Economics

Good transmission is the major commodity a telephone company has for sale. It must be engineered into plant and instrumentalities and these must represent the most economical combination which will bring about the desired quality.

By J. N. PETRIE*

THE MAJOR commodity a telephone company has for sale is transmission — specifically, the transmission of the spoken word. Transmission is such a fundamental factor in the telephone business that a company which wants a lot of good customers, and wants to keep them happy, must know not only what they think of the transmission they are getting but what they would like to get.

According to W. K. MacAdam of the American Telephone & Telegraph Co., "Long distance telephone service has improved to the point where people may now converse as if they were only 6 feet apart. Thirty-five years ago transmission was such that the parties had to talk as though they were 70 to 80 feet apart."

The following table shows the progress in transmission improvement:

"TRANSMISSION IMPROVEMENT OVER THE YEARS"

	Equivalent Separation[1]	
When	Intercity	Trunked Local
35 Years Ago	70-80 feet	40-45 feet
25 Year Ago	45 feet	25 feet
Recent Past	25 feet	10-12 feet
Present Objective	6 feet	6 feet

[1]In feet between talker and listener in a quiet room.

Mr. McAdam made this statement in a paper presented before the 1958 winter general meeting of the American Institute of Electrical Engineers in which he stressed that with transmission of speech the main telephone product, its quality control is not a luxury but a business necessity. He suggested that the communications product be analyzed from the viewpoint of preference rather than tolerance. A knowledge of customer preference allows for a program of up-dating existing plant to modern requirements and is a deterrent to latching on to a physical measurement of noise, volume and distortion and holding it sacred and unchanged throughout the years.

It follows naturally that good transmission for its customers must be one of the basic objectives of a telephone company. In the first place, to create and keep customers; in the second place, to induce the customers to use the service extensively so a profit may be realized. To accomplish these basic objectives implies an understanding of those factors which motivate people to use the telephone. Some of these factors are:

(1) Transmission must be good.

(2) Service must meet the widening field as customers' views and needs change.

(3) Costs must be as low as practicable.

Surveys of various types indicate as follows:

(1) People, especially those who make a large number and variety of calls, are quite critical and will call transmission only "fair" or even "poor" on calls on which it is perfectly possible to talk without repeating at all, or at most, only occasionally.

(2) Although most people are satisfied with the transmission they get on most calls, there are still many calls which they do not like because the received sounds are not loud enough or because noise interferes with the conversation.

(3) With the statistics shown above, and assuming that not too many calls are significantly poorer, and are not adversely affected by noise, there should be very few calls five or 10 years hence which people would consider poor.

(4) People do not want the received sounds to be louder than they now get on connections between customers both of whom are within a mile or so of the same central office.

Beyond these fundamental improvements in transmission over the years, people want transmission to be pleasing and convenient in other ways. Whatever may be needed in this direction, it is the job of the telephone industry to provide it.

There are at least three basic elements involved in the job of providing

(Please turn to page 28)

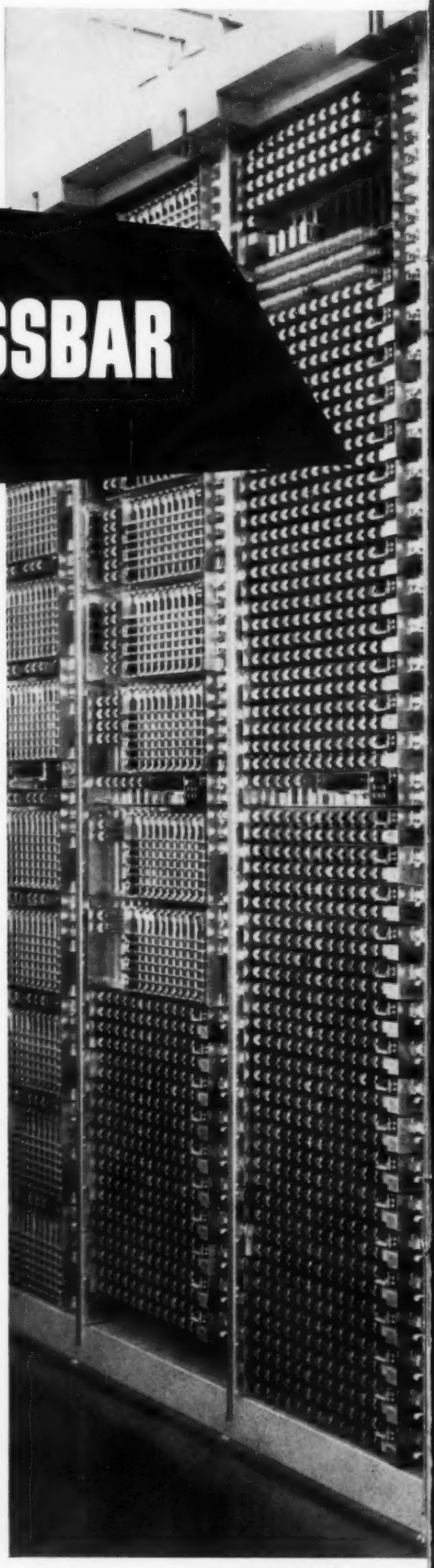
J. N. PETRIE

*Mr. Petrie is Chief Transmission Engineer of Automatic Electric Co. of Northlake, Ill. This is an address he presented at the 1958 Convention of the Ohio Independent Telephone Association.

10 reasons why

NORTH BY-PATH CROSSBAR

is the most advanced switching system available to the telephone industry...



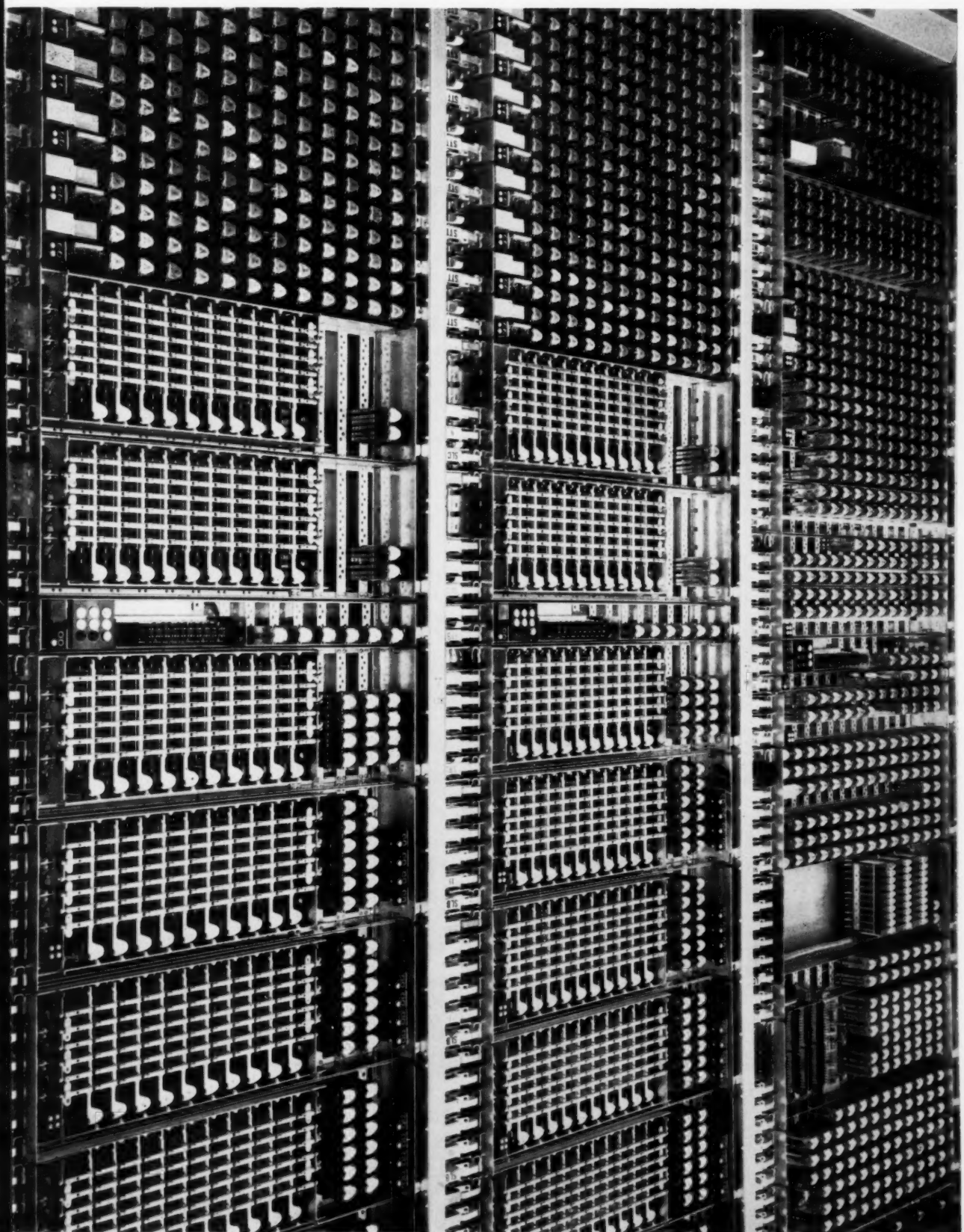
1. Can search over as many as 80 trunks on any call, assuring a high degree of trunk availability.
2. Can route calls on a "2-5" basis without use of inter-toll directing codes.
3. Can "spill forward" as many of the "2-5" digits as necessary. Alternate routing can be provided wherever desired without additional equipment.
4. Any directory number can be assigned for coin service, measured service, PBX trunks or normal flat rate service.
5. All unassigned numbers and unidentified codes are automatically intercepted by tape recording. Directory numbers for which a referral message must be given are automatically routed to the operator.
6. A single switching train accommodates toll calls, test calls and local traffic, providing features appropriate to each type of call.
7. All senders arranged to send digital information by means of dial pulses at 10 or 20 pulses per second or multi-frequency at 7 digits per second, according to trunk requirements.
8. The above types of digital information may be received over any incoming trunk.
9. All the routing and handling equipment for Direct Distance Dialing is part of the standard Central Office Equipment.
10. Reduces requirements for toll board multiples by using a universal toll switching trunk group permitting standardized operating procedures for toll call placement requiring minimum reference to routing bulletins, substantially reducing operator's time and cost.

All these features are standard in North By-Path Crossbar switching equipment. If you are planning on new switching equipment, you'll need North By-Path Crossbar.

PHOTO, COURTESY OF MANSFIELD TELEPHONE COMPANY

NORTH ELECTRIC COMPANY

601 SOUTH MARKET STREET • GALION, OHIO



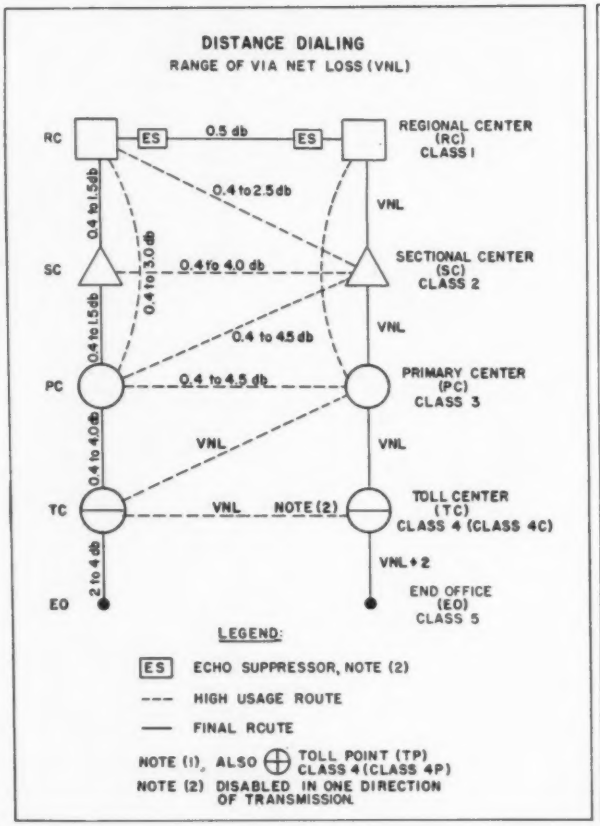


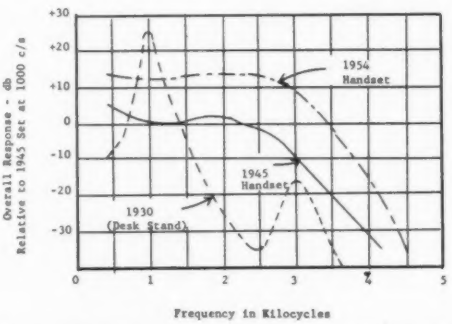
Fig. 1

FREQUENCY RESPONSE COMPARISONS

Frequency band suppressed	Relative articulation
Up to 500 c/s	98%
Up to 1,000 c/s	85%
Above 2,000 c/s	75%
Above 3,000 c/s	85%
Above 3,500 c/s	96%

This table indicates the importance of the reproduction of frequencies above 2,000 c/s, and even above 3,000 c/s, in order to attain the maximum articulation efficiency.

Telephone Sets Including Two 3 Mile 22 Gauge Loops*



*Harold R. Huntley, Transmission Engineer, AT&TCO, Transmission Engineering For The Future, 1955, p. 6.

Fig. 2

improved transmission and at the same time keeping down costs. They are: (1) telephone instruments, loops and trunks; (2) engineering know-how, and (3) good maintenance.

Each element is important and must be properly coordinated with the others. Over-all adequate results at the lowest practical costs can only be achieved by a proper application of instrumentalities capable of high-grade performance. This means that engineering know-how to properly fit together the various component parts must be one of the ingredients to achieve this performance. But, in the last analysis, the finest instrumentalities and the best engineering solutions are, in effect, wasted if the various parts of the total transmission path are not maintained to near peak performance, day in and day out.

First Basic Element

Fig. 1 shows the possible routings and transmission losses which may be encountered on any typical long distance telephone conversation. Besides the "trunks" shown in this figure, every telephone conversation will also involve "loops" and the telephone instruments themselves. From the transmission point of view, "trunks" and "loops" present entirely different problems.

All telephone connections (except between subscribers on the same party line) involve at least two loops. Trunk circuits are involved only if the subscribers being connected are served by different exchange areas. A large proportion of all calls are between subscribers served by the same exchange or by different exchanges in the same "metropolitan" area and connected by relatively short trunks, or by several such trunks connected in "tandem." On a continent-wide basis it is contemplated that occasionally as many as nine or 10 trunks will be connected in tandem.

There usually are both physical and electrical differences between loops and trunks, but there is another difference which has far-reaching economic implications. A loop is set aside for the exclusive use of one or a small group of subscribers. There is, therefore, only a limited diversity in a loop usage and whatever transmission conditions exist on a particular customer's loop will affect every call made or received by him but will not affect the great majority of other customers. On the other hand, trunk circuits are used by many different customers in succession, thus resulting in a great deal of diversity. The transmission conditions on a specific trunk or trunk group will be shared by a great many customers and these may experience wide variations in transmission on successive calls if some trunks of a group or trunk groups exhibit transmission variations.

From the diversity point of view, trunks can usually be much more efficiently utilized than loops because they stand idle much less of the time. This factor also accounts for a large difference in the numbers of circuits in the two categories—there being some 30 million loops serving upwards of 50 million telephones but only about two million trunk circuits.

From a transmission point of view, a subscriber's loop and its associated telephone form a single unit. The transmission performance of this unit will depend, to a large extent, on the characteristics of the telephone set itself. The improvements in transmission performance of modern telephone sets have been so spectacular in recent years that it behooves us to take a closer look at this component. *Fig. 2* gives us some idea of the nature and magnitude of these changes.

Suffice it to say that the 1954 tele-

phone set vs. the 1930 version provides an effective transmission improvement of the order of 15 db. This transmission improvement has increased the probability of crosstalk between circuits, which needs to be taken account of in the engineering of the cable plant and transpositions in the open wire plant. The increase in receiver efficiency tends to make any noise on the lines sound louder; even though the signal-to-noise ratio remains unchanged. Improvements in transmitting efficiency tend to improve the signal-to-noise ratio, but further changes in this direction are not practical, since speech volume between two subscribers in the same exchange on very short loops then becomes too loud and annoying. Most modern telephone sets incorporate features to control this loudness on short loops without affecting the performance on long loops. To secure a fuller realization of the impact these changes are having on plant economies, while at the same time improving the over-all transmission picture, it is necessary to look to *Fig. 3*. This chart shows quite vividly the transmission performance of the 1945 type sets vs. the 1954 version for loops of different lengths, gauges and dc resistance.

It is interesting to note that with the 1945 version telephone set, an average of the transmitting, plus the receiving level of zero db, which is the poorest limit anyone should design for, could be achieved at about 11 kft on 28-gauge cable, at about 14 kft on 26-gauge cable, at 17 kft on 24-gauge, at 22.5 kft on 22-gauge cable, and at 32 kft of 19-gauge cable. Disregarding entirely the 1,400 ohm supervision problem due to the 28-gauge cable, this represents an extension in transmission range for the extreme case of about 3-to-1 at an increase in copper volume of about 9-to-1.

The economics of this situation can be easily understood. If we now design for the same transmission performance, but on the basis of the 1954 version telephone instrument, we find that we cannot get a loop as poor as zero db at the 1,400-ohm limit, while we can go up to 26 kft on 24-gauge, 33 kft on 22-gauge, and up to 47 kft on 19-gauge cable pairs. This represents an average increase of about 50 per cent in loop length *for the same transmission performance*. I think the economics of this situation also speak for themselves.

If we set as our goal a -6 db loop, which is 6 db *better* than the example just quoted, and about what a large percentage of subscribers seem to consider as *good* transmission, then we find the older 1945 version telephone meeting

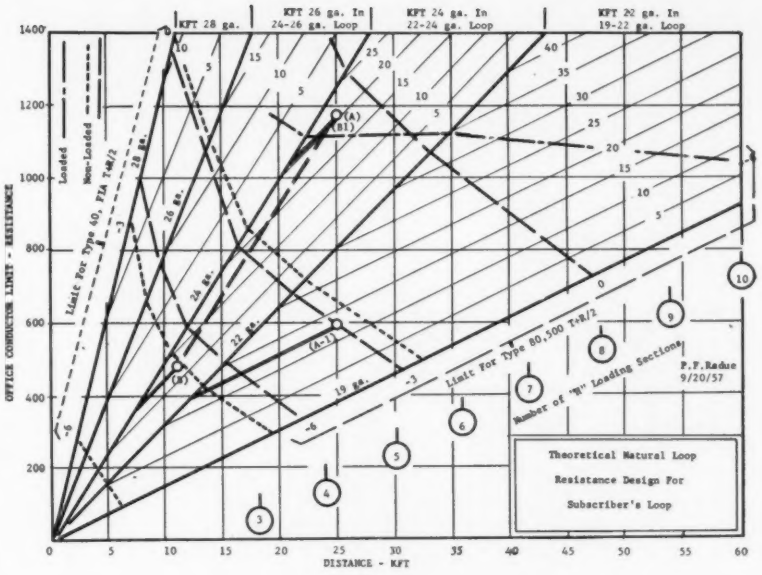

KFT 28 ga.
KFT 26 ga. In 24-26 ga. Loop
KFT 24 ga. In 22-24 ga. Loop
KFT 22 ga. In 19-22 ga. Loop
Loaded
Non-Loaded
Limit For Type 40, FIA T+R/2
Limit For Type 80,500 T+R/2
OFFICE CONDUCTOR LIMIT - RESISTANCE
DISTANCE - KFT
Number of "B" Loading Sections
P.F.Radue 9/20/57
Theoretical Natural Loop Resistance Design For Subscriber's Loop

Fig. 3

the requirements only out to 7 kft, even with 19-gauge cable pairs, while this grade of transmission is obtainable using the 1954 set with 28-gauge cable at 7.5 kft and out to 22 kft on 19-gauge. Again, we obtain a 3-to-1 increase in loop lengths for the same grade of transmission by using the latest instruments.

It is recognized, of course, that we are going to have loops in excess of 22 kft. The chart shows we can go out to at least 65 kft (12 miles) on 19-gauge cable and provide this grade of transmission by using 1954 version telephone sets and *loop loading*. Even this is not the limit because negative impedance repeaters have been successfully applied, together with "long-line" supervisory equipment and local battery talking sets, to loops consisting of 19-gauge cable pairs having a length of the order of 100 kft (19 miles).

I believe it is evident that with these new instruments and "loop loading" of all pairs which are longer than 18,000 feet, we can provide an excellent grade of transmission which generally will be limited only by the supervision limit of the central office equipment involved. The economic advantage of being able to use the finer gauges of cable for a very high percentage of the loops in every exchange and, at the same time, secure major improvements in transmission cannot be calculated. That they are very significant is self-evident. But, today, even newer and more radical solutions are available to increase the diversity in use of the exchange plant.

One of these methods is "carrier". At present its greatest field seems to be in the "rural" part of the plant but there are no basic reasons why it should not be applied in other situations.

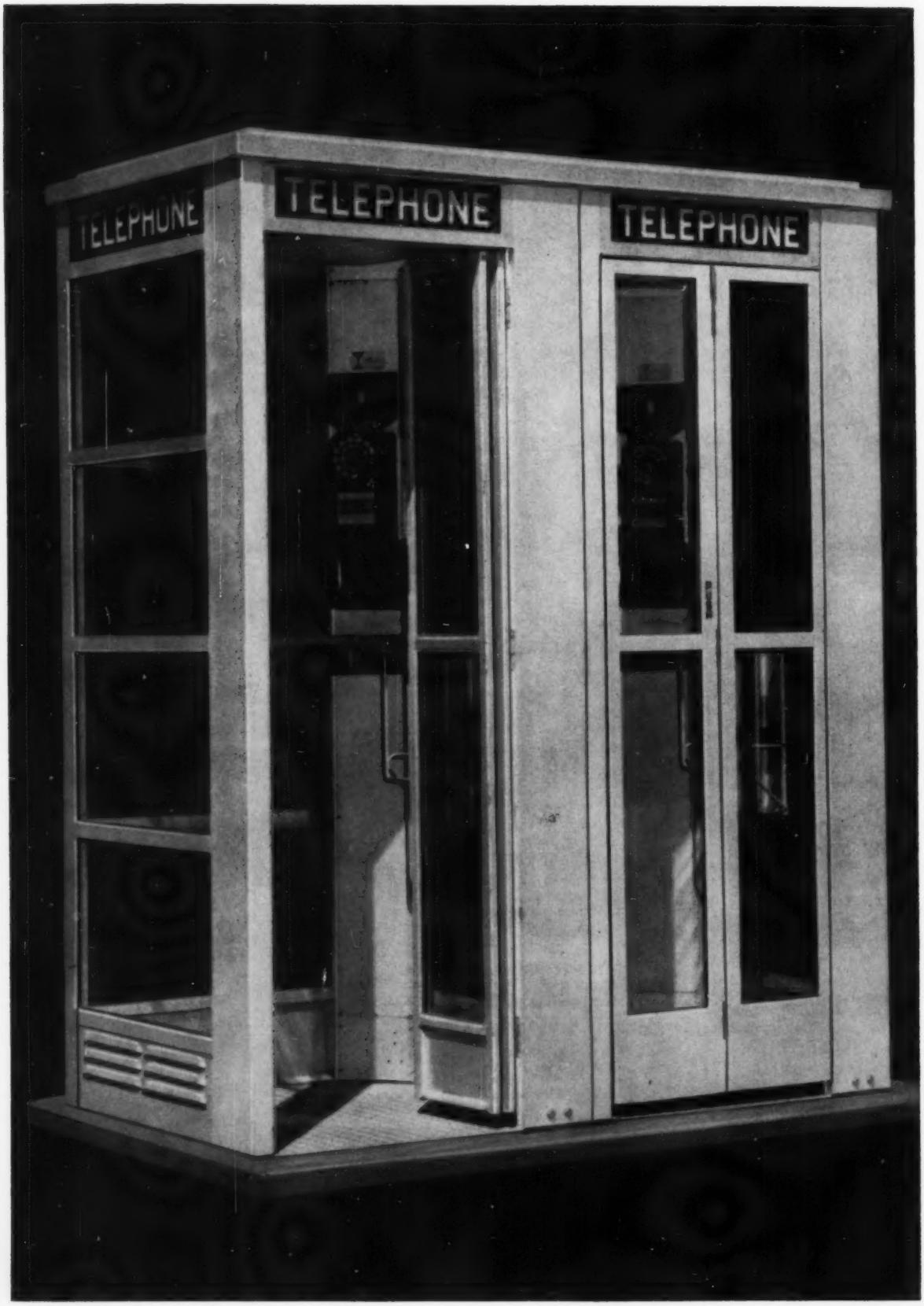
Another new method is "line concentration." This device may well find extensive application in serving our sprawling suburban developments on a more economical basis. Both carrier and concentrators are certain to become more economical as they become more popular and mass production techniques are adopted in their manufacture.

Let us now take a closer look at the trunk plant. Any further major improvements in transmission will have to come as the result of improvements in trunks. This is, in a way, fortunate because there are so few trunks as compared with loops and they average longer.

The longer lengths do increase the technical problems and require rather fantastic degrees of precision in the components used, the engineering in connection with their applications, and the maintenance procedures required. They do, however, lend themselves admirably to the application of electronic devices such as repeaters, carrier systems and radio, on which the hope for low cost transmission rests.

There are several basic differences between circuits having electronic gear and those which do not. The transmission loss at which an electronically derived circuit is operated depends primarily on how this gear is adjusted and is not proportional to length. The manner of adjustment depends on

(Please turn to page 32)


TELEPHONE
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TELEPHONE

ALCOA ALUMINUM OUTDOOR TELEPHONE BOOTHS ARE NOW AVAILABLE IN TANDEM ASSEMBLY

Space savings, easier maintenance, neater appearance increase revenue

Now, for the first time, you can get Alcoa® Aluminum Outdoor Telephone Booths in two- and three-booth tandem assemblies.

Made by Alcoa, the new standard tandem assemblies have the same high-revenue, low-upkeep features as single aluminum booths—plus three big advantages:

More Compact—Tandem booths eliminate the gap created when two or more single booths are placed together. Less space is required for booths in congested areas such as shopping centers, sidewalks and gas stations.

Easier Cleaning—Alcoa tandem assemblies fit flush, so cleaning the outside surfaces becomes simply a matter of wiping with a damp cloth.

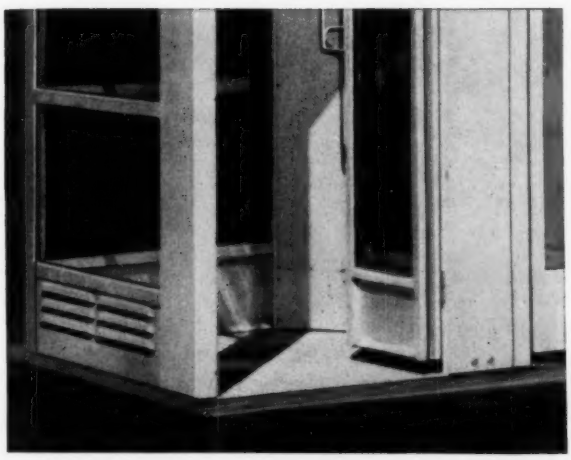
Tailored Appearance—Alcoa tandem booths fit nicely into their surroundings, look as though they had been "custom-made" for the location.

Alcoa tandem booths have a common roof and adjustable angle brackets at the bottom. Attractive, sound-deadening, porcelain-enameled panels are used in place of clear glass in the adjoining sides. Otherwise, the design is the same as for regular Alcoa Aluminum Outdoor Booths—except that they are made to *double* your revenue.

All Alcoa Outdoor Telephone Booths have REA and CSA acceptance and Underwriters' Laboratories approval. For more information on single or tandem design, contact the nearest office of any of these Jobbers:

Automatic Electric Sales Corp.
Automatic Electric Sales, Ltd.
Graybar Electric Co., Inc.
Kellogg Switchboard & Supply Co.
Leich Sales Corp.
Stromberg-Carlson Co.
Union Electric Co.

Aluminum Company of America, 1690-H Alcoa Building, Pittsburgh 19, Pa.



Alcoa's tandem assemblies are smart, modern in appearance and fit flush to reduce cleaning problems. Single concrete slabs for foundations lower construction costs.

Solid, compact construction of Alcoa tandem booths is assured by common roof joining two regular Alcoa Outdoor Booths.

Outdoor Telephone Booths of Alcoa Aluminum Give You All These Features: Corrosion Resistance • Attractive Appearance • Low Maintenance • Simple Installation • Complete Safety • Vandal Resistance • Tandem Assemblies • Free Goodwill Kit

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

Your Guide to the Best in Aluminum Value

"ALCOA THEATRE"
Exciting Adventure
Alternate Monday Evenings

technical factors and not on economic factors. This is not true for a non-electronic circuit which can have its transmission improved only by the use of larger conductors, different physical arrangements, or with heavier loading, all of which increase the cost. The longer such circuits are, the better they must be per unit length, thus, the costs increase out of proportion to the increase in length.

Carrier, especially, has significant transmission advantages for the longer circuits. Carrier is the most important single factor in providing good transmission on the longer switched connections and is fundamental to the achieving of the transmission and signaling requirements so important for nation-wide subscriber dialing.

While carrier reduces the cost per circuit of the longer circuits, it does so only by utilizing complex and relatively costly terminal equipment. As a result, it has generally been difficult to prove in carrier for trunks shorter than about 25 miles. Tremendous economic advantages would accrue by being able to use carrier for the shorter trunks, since, in the Bell System, over 90 per cent of the trunks are less than 25 miles long and over 80 per cent are less than 15 miles long (see *Fig. 4*). There is no reason to believe that these percentages are substantially different in the Independent segment of the industry. Even though great strides have been made in modern short-haul carrier systems, it is still difficult to prove them in under 15 miles. No doubt, more economical carrier will be developed but we can't afford to wait. As a result, for the present at least, for over 80 per cent of all trunks other methods must be used. Certainly, the customers want the improvements in transmission now.

A glance at *Fig. 5* points the way to some of the possible solutions. This figure can be used both for EAS trunks, which should not exceed 6 db loss, and for toll terminating or "end link" trunks, which should not exceed about 3.0 db, exclusive of office and switching losses. The curves show the several types of facilities required to secure a given maximum loss for a given trunk length up to 25 miles. The superimposed table gives the relative costs and estimated cost per pair-mile for the different choices. In any given situation, a number of variables will be involved, but it is significant that essentially the same grade of transmission can be secured for a 25-mile trunk by three different choices varying from 19-gauge, H-88 loaded pairs with one "shunt" type negative impedance repeater to 24-gauge, H-88 loaded pairs

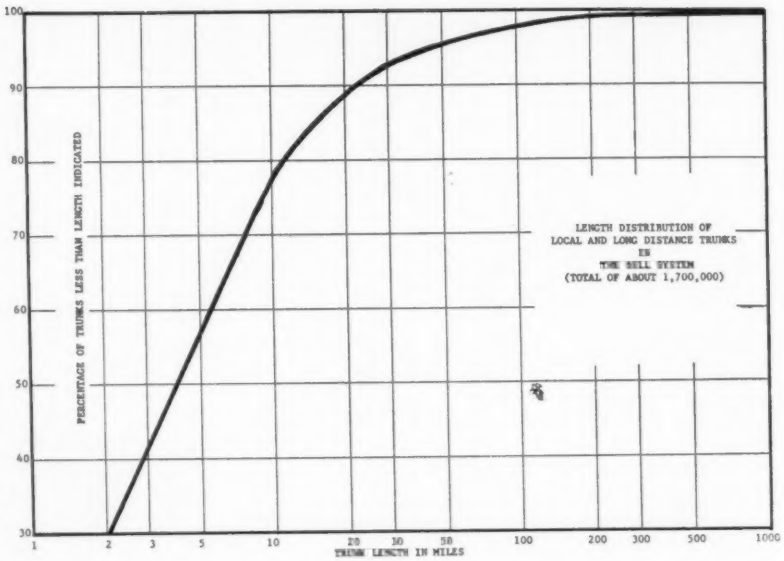


Fig. 4

with two "series-shunt" negative impedance repeaters.

It should also be noted that the same facilities still would be the choice for 3 db "toll terminating" trunks having a length of 12.5 miles. Negative impedance repeaters permit adding gain in voice frequency loaded trunks at such low cost that 24-gauge pairs can be used for practically all trunks which are too short to justify carrier, and, thereby, secure entirely adequate transmission, even though carrier would provide a somewhat superior facility. Both negative impedance repeaters and carrier systems are being produced in quantities which a few years ago would have been considered fantastic. Further improvement in trunks, in the immediate future, will depend largely on these items.

Radio also has entered the picture in recent years. So far in the short-haul field, it constitutes a relatively small percentage of the total circuit mileage. This is partly due to the fact that it must compete with open wire (and cable) as a base facility on which to superimpose carrier. There are some situations where radio has replaced open wire either to gain greater circuit capacity, or to avoid recurring heavy maintenance expenditures on open wire lines because of sleet storm damage. Trends clearly indicate that radio will become more and more an economical solution in providing trunk circuits.

Second Basic Element

In providing improved transmission, improved engineering must not be overlooked. No one part of the engineering job can disregard the other parts; this includes transmission engineering. Different companies approach this job in different ways, but, in the long run, the total objective should be a plant which will give the best possible performance, for the longest possible time, at the lowest possible cost.

The plant these engineers buy today determines to a large extent for years to come how good the service will be, how well pleased the customers will be, and if the company will be making or losing money. It, therefore, behooves every engineer to do the best possible job for the future, as well as for the present. This sort of job involves as much imagination and far-sighted planning in the application of the new instrumentalities as the development of the instrumentalities themselves.

The engineer must fashion the overall system to be long-lived, and each of its parts must perform its functions in such a manner as to provide the best possible service at the lowest possible costs, not only today, but for a long time in the future. Historically, the costs of electronic devices in relation to physical outside plant have gone down in price. This trend will be accelerated with improved "know-how", quantity production, and a dwindling world supply of copper. This dictates planning on a basis of a minimum of physical plant and a maximum use of electronic gear.

With the rapid expansion of our metropolitan centers, and decentralization of industry, electronic gear offers an additional great advantage of mobility at low cost, as compared to physical plant, to permit keeping up with moves of population centers. Insofar as possible, the engineer must also anticipate the needs for transmission of

information other than speech, such as the several forms of "data transmission" which have been much publicized lately. Above all, he must keep an open mind and be prepared to take advantage of every new device and facility at his disposal. Certainly, this approach involves sticking out your neck and even making mistakes, but these will be a lot less costly than the ones resulting from following tradition too closely and blindly.

Third Basic Element

To provide improved transmission it is necessary to provide adequate maintenance. This reminds me of a story told me by a friend after having spent several years in Arabia. It seems the Arabians have absolutely no concept of maintenance so they buy one Cadillac after another; race them over the desert sands until the engine literally falls apart, due to lack of oil and other adjustments, then leave it and buy another one. And, this, in an economy which wouldn't exist if it were not for oil. Even as fine and well engineered a car as a Cadillac needs maintenance.

It is well to engineer and build a telephone plant with all of the latest features boldly and imaginatively executed. But, regardless of how well it is engineered, it will fall short of its purposes if it doesn't perform according to design, hour after hour, and year after year. With a plant whose performance depends on electronic elements, the maintenance approach is quite different from that of a plant consisting of only inert elements.

Maintenance of inert plant consists largely of keeping the pieces in good physical condition and properly connected together; "maintenance" in this category of plant is essentially the same as "repair". Adding electronic gear adds the problem of proper "adjustment". The problem of keeping telephone transmission systems, and the telephone circuits derived therefrom, "adjusted" to peak performance is quite involved. In a far-flung system there are many places where adjustments can be made and these are widely separated and involve many different people with varying degrees of competence. And yet, these adjustments must all be made properly, in a coordinated manner and to very close tolerances or the system will not perform up to its design specifications even if no physical troubles exist.

H. R. Huntley of the American Telephone & Telegraph Co. presented a paper before the American Institute of Electrical Engineers in June, 1956, in which he made one of the most fundamental and profound statements on this subject. He said, in part:

"The problem of having every adjustment right is complicated by the fact that each of the possible adjustments interacts with the others. For example, it is always possible at any particular time to compensate for maladjustments in one part of a system by maladjustments in another part so that, superficially, the system seems to be performing correctly. But, the difficulty when this is done is that as soon as the temperature or some other condition changes, or as soon as somebody somewhere corrects one of the maladjustments, the compensation fails and the circuits may be in worse shape than if nothing at all had been done. It must be realized, also, that the compensating maladjustments which have been made may be at points which are separated by many miles.

"Thus, correct adjustment is a formidable problem. However, it is being solved more and more successfully in many places. The secret of doing it successfully lies not so much in increasing the skill of the people who make the adjustments as it does in increasing the understanding of the need to do the job right, and of the principles involved. Perhaps as good a way as any to put it is how one of the European teams who were visiting the United States expressed their idea of American industrial progress. It is reported that they were much more impressed with American 'know-why' than they were with American 'know-how'.

"The job, then, rests more on people than on instrumentalities. Therein lies the problem, and the solution. People can be educated; machines cannot. While it is much more difficult to educate people than merely to train them, the rewards are correspondingly greater. There is no alternative. Electronic gear is here to stay and it will have to be kept in adjustment by people. And the closer one gets to the people who have to do the job, the more confident he becomes that it can and will be done."

We can conclude, therefore, that since "good transmission" is one of the most important products a telephone company has for sale, it ought to be a "quality" product so as to stimulate demand for it. Good transmission must be achieved as economically as possible. This requires utilizing to their fullest potentialities all the available techniques such as:

(1) Small gauge cables.

(2) High efficiency telephone instruments (you can't buy "db's" cheaper in any other shape or manner).

(3) Loading of all trunks which are over 10,000 feet long.

(4) Loading of all subscriber loops which are over 18,000 feet long.

(5) Voice frequency repeaters rather than larger gauge cables or open wire, both for trunks and on subscriber loops over 65,000 feet long.

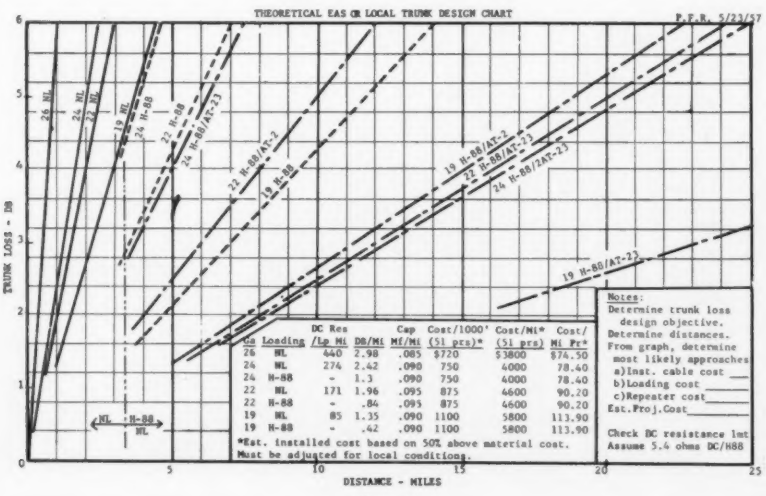
(6) Special "long-line" supervisory equipment on loops beyond the normal supervision resistance limit of the central office.

(7) Use carrier systems wherever economically justified.

Good transmission doesn't "just happen"—it must be engineered into the plant and instrumentalities and these must represent the most economical combination which will achieve the desired quality. Electronic gear will loom large in most of these situations.

Good transmission, when based on electronic gear, doesn't "stay put" by itself. It must be "retuned" by periodic maintenance procedures, just like a modern, high-powered automobile must be "retuned" frequently to give you the "get-away" and "speed" which were built into it by the manufacturer.

Finally, the economic rewards in business today usually go to those who have earned them by producing a good product at the right price. I believe this certainly applies in the telephone business. How good a product you produce is up to you—the tools with which to do the job are available.



Ga	Loading	DC Res /Lp Mi	DB/Mi	Cap Mf/Mi	Cost/1000' (51 prs)*	Cost/Mi* (51 prs)	Cost/ Mi Pr*
26	NL	440	2.98	.085	$720	$3800	$74.50
24	NL	274	2.42	.090	750	4000	78.40
24	H-88	-	1.3	.090	750	4000	78.40
22	NL	171	1.96	.095	875	4600	90.20
22	H-88	-	.84	.095	875	4600	90.20
19	NL	85	1.35	.090	1100	5800	113.90
19	H-88	-	.42	.090	1100	5800	113.90

Fig. 5

Your subscribers will see this advertisement in the Sept. 13 issue of Saturday Evening Post!

This advertisement is part of Automatic Electric's continuing program of national advertising in the Saturday Evening Post. It will help create demand for Wall Telephones in your community.

Tie-in with this big promotion! A beautiful, two-color poster (adapted from the photo in the ad) has just come off the press! We'll be glad to send you one or more for use in your business office or other prominent location. Write for your free copy today. And—be sure to order enough Type 90 Wall Telephones to meet the demand in your area.

that's the belle of the kitchen!

AUTOMATIC ELECTRIC

Northlake, Illinois

Subsidiary of **GENERAL TELEPHONE**

You'll love this second phone in your life!

It saves steps.

It saves space.

And after it has been in your kitchen, hall or playroom just one day, you'll wonder how you ever got along without this new Automatic Electric telephone.

Because it's mounted on the *wall*, it leaves your counter or table clear. Because the receiver is at the side, it doesn't project into the room – another space-saver.

Because the dial is up-tilted, it's easy to see and use from either a sitting or standing position.

And because it's made in 10 lovely colors, it's certain to fit into your decorating scheme.

This is one more in a long line of "firsts" from Automatic Electric that goes back to the first dial phone–one more example of the ingenuity and imagination Automatic Electric brings to every problem in the fields of communication and control.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

DOWN THROUGH the years, the telephone industry has been confronted with the problem of taking a 24-volt tap from a 48-volt storage battery. Up until now, this has usually been accomplished by the use of CEMF cells or resistors.

When using this method, however, approximately half the power was dissipated in the voltage reducing device. Another method, sometimes used, was to tap the 48-volt battery in order to provide the 24-volt supply.

The disadvantage of this system was that the storage battery cells were unevenly charged and discharged unless a separate 24-volt charger was provided to maintain the cells used to supply power to the 24-volt service.

Now these disadvantages have been eliminated by a device recently placed on the market known as the "Bat-Tap". This device converts the 48-volt dc to 24-volt dc without moving parts at efficiencies as high as 80 to 89 per cent from 25 per cent of its rating to 30 per cent overload. The "Bat-Tap" is a unique transistorized inductor arrangement combined with silicon diodes. The 48-volt dc is converted into ac and back into 24-volt dc by a simple foolproof circuit which is conservatively designed to withstand intermittent overloads of 30 per cent.

The "Bat-Tap" is a compact unit, designed and constructed to mount in a 19-inch rack. Its length is 19 inches, length of cover 17 inches, height 6¾ inches, dept 9¾ inches over fasteners. Weight is 32 pounds.

•

A patent recently issued to Dr. A. B. Du Mont, permits two TV programs to be viewed simultaneously on one set. This receiver is equipped with two picture tubes, one aimed in the usual manner, and the other pointed upward. One program passes through a semi-transparent mirror and the other is reflected from it. The two programs are superimposed on one screen.

Viewing is accomplished through polaroid glasses or polaroid panels. The viewer may make his choice of programs by simply reversing the glasses or the panels. Individual earphones are used to separate the sound portions of the programs. With this set, father can watch the ball game while mother views her favorite movie.

•

Of Michigan Bell's 1,230 retired personnel, about four-fifths are living in Michigan. The other one-fifth is spread across the country—east and west, north and south. The directory of "Retired Employes" indicates that there are 238 living in 30 states besides Michigan. In addition, 12 live in Canada, one in Alaska, and one in Tahiti, the French island in the Pacific.

Florida rates high as a place for retirees to live. About half of those living outside of Michigan are in Florida. They praise the climate and the sociability they enjoy with others who are retired. Many have built new homes and have become active members of their communities.

Rated next in popularity is California. There are 29 living in various cities on the west coast. Arizona has attracted 15 people. Six live in Illinois, eight reside in Indiana, and three in Missouri while there are seven in New York, five in Ohio, and four in Pennsylvania. In Texas there are seven, Wisconsin nine.

In the remaining 19 states, there are fewer people—one or two in Alabama, Arkansas, Colorado, Connecticut, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, Mississippi, Montana, New Jersey, New Mexico, North Carolina, Oklahoma, Oregon, Virginia, and in the State of Washington.

•

A large scale model of a complete wood pressure treating plant has been placed on exhibit by the Smithsonian Institution in Washington, D. C. It is anticipated that thousands of the visitors to this national museum will view this interesting display.

•

Some of the Bell companies are changing to a new method of counting cables called the "even cable counts." This method has been devised so as to utilize all of the advantages of a new simplified color-coded even PIC cable which will have 25, 50, 75, 100, 150, 200, 300, and 400 pairs. Basically, this plan requires redesignation of the extra pairs, presently numbered on the central office main frames as 101, 202, 303, etc., as "X" (extra) pairs and thereby removing them from the regular numbering sequence. The other pairs (over 101) are renumbered to fill the slots vacated by the extra pairs.

We have advocated this practice for

Traffic Engineering Handbook

Last week TELEPHONY concluded its "Traffic Engineering Handbook" by Gilbert R. Brackett.

We have had numerous requests for reprints of these articles as a complete handbook. But, in making a decision as to whether or not they will be reproduced, it is necessary that we have advance orders for reprints.

Therefore, TELEPHONY requests that readers who want this series under one cover place their orders immediately, indicating how many reprints they would want.

years. It is obvious, however, that it required the adoption of the color code for outside distribution cables to cause others to think likewise.

•

The underground structures of a large city are enormous in this day and age. It is claimed that in New York City, subway tracks total 726 miles; sewers 5,000 miles; watermains, 5,528 miles; electric cables 19,000 miles; gas mains 7,000 miles; telephone wires 15 million miles; high pressure steam lines 87 miles; and TV cables 2,200 miles.

•

Interior wiring cable now available with solid tinned copper conductors, insulated and jacketed with long-lasting flame-proof vinyl, can be used to advantage on all inside wiring jobs. This cable proves especially useful for wiring key type telephone systems. It is also fully color-coded so that time need not be wasted in testing or buzzing out pairs. Sizes are available from 60 to 101 pairs.

•

If you are interested in computers, and who isn't these days, we suggest that you obtain three volumes which come in soft covers by John S. Murphy, title: "Basics of Digital Computers." These books may be obtained from TELEPHONY at $2.50 per volume or the three-volume set for $6.95.

This three-volume "picture-book" course makes it easy for anyone with a knowledge of the fundamentals of electronics to understand and master the basics of electronic digital computers.

Volume one reviews the development of computers, then thoroughly explains the basic theory of computer arithmetic, data representation, the program, AND and OR circuitry, and control.

Volume two imaginatively and clearly discusses the logical elements, circuits, typical types or signals, and magnetic cores, which are then combined to show a few units such as encoders, decoders, counters, and adders that are typical of computers.

Volume three handles the large system aspects of computers with separate discussions of types of memory, control system, and input-output equipment. Timing is also given extended treatment. This "picture-book" course provides a broad background in computer theory, enabling you to learn the details of any specific computing system much more easily.

•

It is claimed that the thing that ruined radio was the programs.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Can you describe the current flow test set, and how it is used in the maintenance of central office equipment?

A. The current flow test set is an instrument used to make electrical tests on relays. Various values of current may be applied to an external circuit by operating the controls on the test set. These sets are usually equipped with a number of special cords that are provided with different types of plugs and connectors to aid in connecting the test set to almost any type of telephone central office relay circuit.

Basically, the internal circuit of a current flow test set consists of a milliammeter in series with a variable resistor for regulating the current. Keys and switches mounted on the test set panel are used to set up circuit arrangements. Jacks and binding posts are provided for connecting battery and ground to the set, and for connecting the set to the circuit under test.

•

Q. What advantages can we expect from the loading of exchange cable?

A. A manufacturer of loading coils furnishes us with the following information on this subject.

By applying load coils on telephone circuits, the unit loss (db's) can usually be reduced to one-third or one-fourth of the non-loaded value. From an economic point of view, loading of 24-gauge cable pairs can be made as satisfactorily as non-loaded pairs of 19-gauge cable having three times as much copper.

Other advantages are that it is possible to avoid the use of repeaters in many cases by extending the transmission range or it is possible to employ a lesser number of repeaters. For example: a loaded 19-gauge cable will transmit three times the distance of a non-loaded 19-gauge cable.

Loading is required where necessary to meet established transmission standards. In general, these standards call for a maximum transmission loss between the exchange and the most distant subscriber not to exceed 6 db. The loss between exchanges, and between the exchanges and the toll center, should, in general, not exceed 3 db.

•

Q. In the design of an aerial exchange distribution plant, what rule should be observed in selecting the proper sizes of cable terminals?

A. One general rule often used is to provide cable terminals with a capacity of three times as many pairs as forecast studies indicate drop wires will work out of this particular terminal during the next 10 years. It is always a safe and economical plan to provide terminals of ample size.

•

Q. Do you know whether there will be any objection to community television companies installing their distribution cables on telephone poles in a medium sized exchange?

A. Some telephone companies have entered into contracts to permit this practice. In most cases, it will depend on whether or not adequate clearance can be provided and whether or not poles are overloaded. The joint construction should also conform to the laws of your state.

•

Q. Can you advise us where we may obtain a book that gives a complete treatment of the subject of sound?

A. We suggest that you obtain a new book called "*Sound*" by Dr. Alexander Efron. This 80-page paper-back edition sells for $1.25. It can be purchased from TELEPHONY.

The book gives a complete treatment of the subject beginning with an introduction to sound, and covering hearing, speech, and music, with a full discussion of the wave nature of sound. The text also provides a comprehensive study of the physics of sound, including such topics as sources of sound energy, the ear, perception of pitch, loudness, quality, standing waves, interference, and resonance.

Courts and Commissions

Cal. Hotels Seek Higher Local and Toll Rate

California hotels told the California Public Utilities Commission recently that they are losing money on their telephone switchboards by charging guests only 15 cents for local calls.

The California Hotel Association urged that the local rate be boosted to 20 cents and that the surcharge on long distance calls be raised from 25 to 30 cents.

Mrs. Dorothy Hall of Lafayette, an accountant, testified for the association that 23 representative hotels had lost more than $500,000 last year on switchboard service they provided their guests. She did not identify the 23 hotels.

The hearing, before Ray E. Untereiner, commissioner, and John M. Gregory, examiner, was to be continued until Aug. 11.

SB T&T in Ala. Files Bid To Claim Bonded Funds

The Southern Bell Telephone & Telegraph Co. on Aug. 13 moved to retain more than 25 million dollars it has collected in Alabama during the past four years under a contested rate schedule (TELEPHONY, Aug. 2).

In an application for a rehearing filed before the Alabama Supreme Court, the company contended that when the high court, in a ruling on July 24, reversed an order of the Alabama Public Service Commission, a bond which Southern Bell was required to post from the revenue produced by the increased rates, was discharged.

The bond was required for the refunding of customers in the event a refund is ordered.

In a lengthy and technical brief accompanying the petition for rehearing, attorneys for Southern Bell argued that the court's July ruling had in effect declared "unlawful and void" an earlier ruling by the commission, and as a result the higher rates that have been charged since June 1954, are the legal and lawful rates.

The rehearing request is the latest step in the rate case which had its beginning in January 1954. At that time Southern Bell petitioned the commission for a 7-million-dollar increase in rates.

In April 1954, the commission denied the increase, with Bell immediately appealing this decision to Montgomery Circuit Court. Circuit Judge Walter B. Jones reversed the commission ruling in June 1954 and authorized the new and higher rates to go into effect.

However, he ordered the company to post a bond for the revenue produced by the increase in the event a refund was ordered later.

In November 1955, after Judge Jones had issued his final decree in the case, the commission filed an appeal of his ruling with the state supreme court. It was on this appeal that the high court ruled July 24.

In the July 24 ruling the supreme court took issue with both the commission and Judge Jones and ordered that the case be returned to the commission for further proceedings. However, in what may be significant in the light of Bell's petition for rehearing, the court did not say in its decision that the commission ruling was "void and unlawful."

Instead, the court merely ordered the commission to start anew in its determination of what constitutes the "reasonable value" of Southern Bell property in the state.

The major issue raised by Bell Counsel Robert E. Steiner Jr. and James Simpson in the rehearing brief was that the increased rate which has been in effect since June 1954, is the lawful rate and thus is not refundable to customers regardless of what decisions might be in the future.

"When on judicial review the order of the public service commission is held not to be a valid order, the order of supersedeas staying the commission's order is terminated and the bonds given pursuant thereto and discharged," the brief declared.

"The legal effect of this court finding that the commission's order was unlawful and void was that by operation of law the rates filed by the company have been lawful rates since June 18, 1954, and remain the lawful rates until the commission fixes new and different rates for the future," the brief continued.

Steiner and Simpson added in the brief that the commission order "which has been determined by the court to be based on an error in the application of the law" is no longer an effective or valid order "but a nullity for failure to comply with statutory standards."

"The conclusion is inescapable that when this court nullified the commission's order, the rates filed by the company became the lawful rates," the brief continued.

The Southern Bell counsel went into detail pointing out that a utility had the right to fix rates, subject to the approval of the legislature or to an agency created by the legislature (in this instance, the commission).

"If the public service commission order is found to be unlawful or in violation of the commission's statutory authority, the only barrier to the utility's common law right to fix its rates has been removed," the brief held. "The utility has the right to charge the rates initially filed by it, until such time as the commission may fix other lawful rates for the future."

The actual amount of money at stake in the litigation is not known; however, commission records showed that $21,465,000 had been collected as of Jan. 1, 1958. Receipts from the increase have averaged approximately $600,000 a month, which would indicate the fund now contains roughly $25,645,000.

A spokesman for the supreme court said on Aug. 13 that the tribunal would not take action on the rehearing petition until the commission had filed its answer to the Southern Bell brief.

Rule Fla. Court Can Stop Commission from Rate Repeal

The First District Court of Appeals on July 28 ruled that Florida Circuit Judge Hugh Taylor did have jurisdiction to stop the Florida Railroad & Public Utilities Commission from repealing a temporary rate increase for the Southeastern Telephone Co., Tallahassee (TELEPHONY, July 19).

Judge Donald K. Carroll, writing the

unanimous opinion of the court, said allegations that Judge Taylor had committed an error in issuing an injunction against the commission were insufficient to justify a writ of prohibition.

Attorneys for the commission and seven cities fighting a toll increase claimed that Judge Taylor's May 30 injunction amounted to a judicial review of the commission's action and should have been decided by the state supreme court.

Judge Tayor ruled on June 27 that he had jurisdiction because to have delayed an increase would have deprived the company of a just return on its investment.

Ind. Long Distance Rate Raise May Be Appealed

Indiana Public Counselor George L. Diven was reported on Aug. 4 to have said that he will appeal to the State Appellate Court an Indiana Public Service Commission ruling granting intra-state long distance toll increases to 185 telephone companies (TELEPHONY, Apr. 12).

This, according to the report, would be the first time a public counselor ever took legal action against the commission.

Mr. Diven said he opposed the commission's ruling on the grounds that public hearings were not conducted on the matter.

Last May, the commission gave the 185 companies the increase in intra-state rates along with Indiana Bell Telephone Co. after hearings on the Bell company's petition.

The commission on Aug. 1 denied protesting customers' demands that hearings be held for the 185 companies as was done in the case of Indiana Bell.

Ask Calif. Cos. To Reduce Income Taxes, Lower Rates

A petition filed with the California Public Utilities Commission by the state attorney general's office on July 31 asked that utility companies be compelled to take advantage of a federal tax law in a way that would permit them to lower consumer rates.

Written by Deputy Attorney General William M. Bennett, the petition said utilities are eligible under a 1954 federal law to speed up write-offs on plant expansion and thereby reduce their federal income tax.

The petition contended the commissioners should make companies do this, and then make them pass the benefits along to consumers.

Asserting that the companies must "minimize costs of doing business consistent with the fair rate of return and efficient service to customers," the petition said consumers should not have to pay for "phantom taxes" in their utility bills.

SENTINEL OF THE NIGHT

By T. Harry Thompson

Back along the line somewhere, I put that headline on a page for the Bell Telephone System.

The thought is as valid today as it was then.

The telephone is not just an armored guard in that castle every man calls home. It is far more versatile.

It can summon a doctor, a policeman, or the fire department when terror strikes, any hour of the 24. It is a mute witness when a sob vibrates into the night.

In joy or sorrow, it is the next best thing to a handshake or a hug.

This past winter, when temperatures were down to six degrees Fahrenheit, we were scheduled to move into an apartment. The movers, oldest and largest in town, telephoned that they were grounded . . . couldn't get their vans out of the garage for loading.

Snowdrifts and abandoned cars blocked those leviathans, yet the telephone call came through as handily as it might in mid-June. It was that experience which triggered this encomium.

How, I wondered, did advertising and selling and business in general get along before Alexander Graham Bell?

As an instrument of communication, the telephone is irreplaceable. As a *Sentinel of the Night*, it is priceless. As a friend in need, it is without equal.

Humbly, I hymn the telephone!

—Reprinted from *Sales Management Magazine*.

Del. Commission Appeals Superior Court Decision

The Delaware Public Service Commission on Aug. 6 announced that it would appeal to the State Supreme Court a recent Superior Court decision which would restore $268,703 in increased rates to the Diamond State Telephone Co. (TELEPHONY, Aug. 16).

The commission on Jan. 15 had denied the company $773,334 of $1,880,000 sought in annual increased rates. On an appeal by the company, Superior Court Judge James B. Carey reversed four of the commission's rulings and paved the way for restoration of $268,703 out of the $778,334 denied to the company by the commission. It is this decision which now will be appealed by the commission to the Supreme Court.

General of Ky. Markets Stock

The General Telephone Co. of Kentucky, Lexington, has sold $1,975,000 worth of preferred stock, $50 par, to Mutual of New York, Equitable Life Assurance Society of the United States, and New York Life Insurance Co. The company will use the money to repay bank loans and for construction.

OK Financing, Name Change; Ask Sale Approval in Ark.

The Arkansas Public Service Commission on Aug. 4 authorized the Arkansas Telephone Co., Clinton, to borrow $100,000 to pay off a debt (TELEPHONY, Aug. 2).

The company said that it wanted to borrow the money from the Bankers National Life Insurance Co., Montclair, N. J., to pay a debt it owed to the Boatman's National Bank of St. Louis.

The commission also authorized the company to sell 200 shares of stock at 200 per share.

In other actions, the commission allowed the Wickes Telephone Co. to change its name to the Wickes Telephone Co., Inc.

The commission also set a Sept. 3 hearing date on the application of R. L. Thomas to sell the Standard Telephone Co., Marshall, to Leona Thomas.

Approve Rate Increase For General of California

The General Telephone Co. of California, Santa Monica, on Aug. 15 was granted a rate increase of $5,860,000 by the California Public Utilities Commission (TELEPHONY, Apr. 19). This is less than one-half the $12,511,000 originally sought.

The commission estimated that the proposed rates would yield a rate of

(Please turn to page 42)

TESTING. Western Electric's Richard Siney tests and adjusts a component in the new TJ Microwave Radio Relay System. Here at our Merrimack Valley Works, we also produce carrier equipment, which makes it possible to send hundreds of calls simultaneously over a single telephone cable.

THE MERRIMACK VALLEY

About 30 miles north of Boston, the trim New England countryside has a new neighbor . . . Western Electric's Merrimack Valley Works. Here the Valley's people help us with our telephone work for the Bell System — which has helped restore the Valley's well-being.

Long known throughout the world for textiles and shoes, the Merrimack Valley area today is the home of widely diversified industry. The Merrimack Valley people proved themselves skilled, capable, and versatile as new, modern industries began sprouting up all over the Valley. Among the first to come were Western Electric plants in Haverhill and Lawrence . . . recently followed by our new plant at North Andover, one of the largest in the area.

Here in the Merrimack Valley, we turn out telephone equipment for use in the out-of-sight world behind Bell telephone service. It's part of our job as manufacturing and supply unit of the Bell System.

Up and down the Valley, the benefits of our telephone work come to life: in the taxes paid to local governments . . . in our nearly 6,000 jobs this work has created . . . in over $7,000,000 worth of business last year for 228 local suppliers (just a fraction of 1,566 W. E. suppliers in Massachusetts).

In the Merrimack Valley, we feel these social and economic benefits are as important as the products we make.

Besides Merrimack Valley, Western Electric has plants in 22 other cities where we also make telephone equipment for the Bell System. Last year we purchased 1¼ billion dollars worth of raw materials, products and services from over 33,000 suppliers located in every state. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers in 32 different cities.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

CULTURAL HERITAGE of New England is part of Merrimack Valley tradition. Here Western Electric employees—Gerry Hendry, Irene Sheehan and Maureen Smith — visit the birthplace of famed poet John Greenleaf Whittier in Haverhill, Mass. It was in this historic house that he penned the immortal "Snowbound."

EDITOR'S OPINION. Irving Rogers, Editor and Publisher of the Lawrence, Mass., *Daily Eagle* and *Evening Tribune*, says, "It's hard to overestimate the contribution Western Electric has made to the economic recovery of the Valley. Besides providing jobs and payrolls, they've helped spark confidence in the Valley's future."

TALKING POINT. David Lane (left), member of the buying staff of our Merrimack Valley Works, talks with Vice President George Emmott of the Dyer-Clark Company, a supplier of electrical parts to W. E. This Lawrence firm is one of 1,566 companies we did business with last year throughout the state of Massachusetts. Total Western Electric purchases in Massachusetts amounted to over $49,000,000 . . . helping to bulwark the economy.

SCHOOL BOARD members David Rockwell (right) and Kingdon Hamilton (center), both of Western Electric, compare notes with Principal Charles Yeaton of the Atkinson (N. H.) Academy, second oldest coeducational school in the nation. Many W. E. people participate voluntarily in worthwhile community activities like this.

return of 7.1 per cent on net investment as compared to 6.22 per cent under the old rates.

The commission refused to go along with its staff's view that General Telephone's manufacturing and sales subsidiaries should be restricted as to profit just like Western Electric Co., the manufacturing subsidiary of the Bell System.

The commission said there was no similarity between the Bell System subsidiary and the General Telephone subsidiaries because the General companies buy only 42 per cent of their supplies from General's manufacturing and sales subsidiaries. (See "In the Nation's Capital" on p. 17 for further discussion of this case.)

Three Minn. Independents Get Rate Increases

The Minnesota Railroad & Warehouse Commission on Aug. 4 granted a rate increase to be effective on conversion to automatic operation to the Tyler Telephone Co.

The company has received a $477,000 Rural Electrification Administration loan and is converting its Tyler and Arco exchanges. Effective on conversion, extended area service will be offered between the two exchanges, which serve 577 local and 332 rural company owned stations.

Net operating revenues, which are $36,421 under the old rates will increase to $66,432. Total expenses will increase from $32,057 to $48,988. Net income will rise from $4,364 to $17,444, giving the company a 3.44 per cent return on a rate base of $506,663.

Old gross and new net rates are as follows:

	Tyler (Old) Manual	*Arco (Old) Manual*	*Tyler & Arco Automatic (New)*
One-party business	$5.75	$2.50	$7.50
Two-party business	4.25		6.75
Multi-party rural business			6.25
One-party residence	3.25	1.75	4.75
Two-party residence	2.50		4.25
Four-party residence			3.75
Multi-party rural residence	3.25	2.00	4.25

•

On Aug. 11, the commission granted a rate raise to the Valley Telephone Co., Browns Valley.

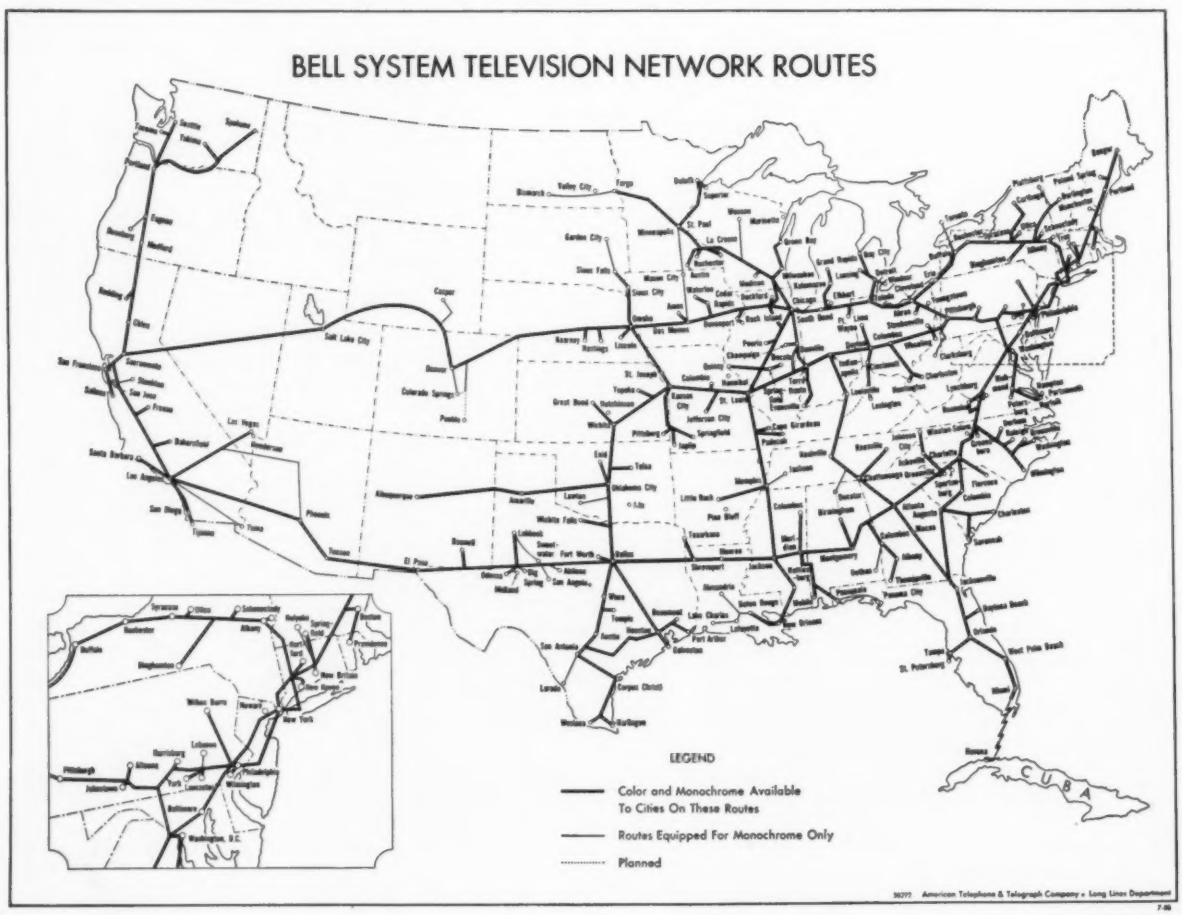
The Valley company has added $103,876 in total plant additions between the years 1953 and 1957 in order to convert to automatic operation. The company serves 353 local and 77 rural company owned stations, and 38 switching stations.

Net operating revenues under the old rates are $23,715 which will increase to $27,548 with the new rates. Total expenses will increase from $19,205 to $21,148. Under the old rates the company had a net income of 4,510, which will be increased to $6,400 under the new rates, giving the company a 5.65 per cent return on a rate base of $113,233.

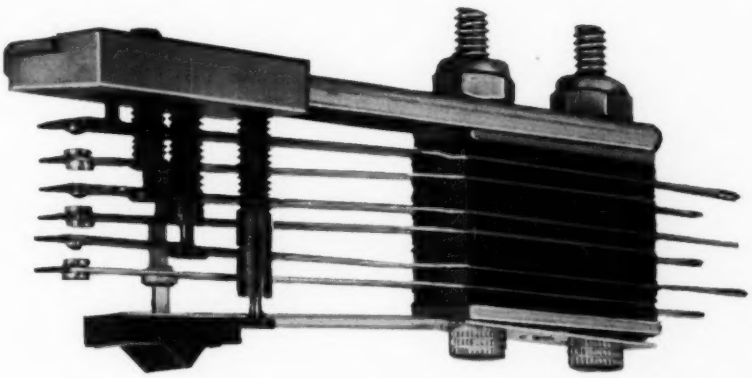
Old and new net rates are as follows:

	Old	*New*
One-party business	$5.00	$6.50
Two-party business	4.25	5.50
Multi-party rural business	4.50	5.25

(Please turn to page 44)



ESCO RINGING EQUIPMENT



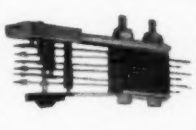
MEMBER

. . . a new twist in interrupter design assures simple, permanent pile-up adjustment

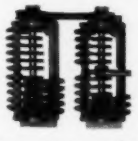
Just a simple twist of the set screws in ESCO Interrupter Pile-Ups, and you get accurate spring adjustments that stay put. You never need to use old-fashioned spring bending methods. Springs and contacts last longer because springs retain their original shape and tension, and contacts stay in alignment. This new design, too, allows up to six adjustable springs on the same pile up and that means better timing with fewer cams.

But this exclusive adjustment feature is just one of many reasons why operators and engineers who design and install equipment insist on ESCO. Compact vertical-mounting, factory pre-wiring, and permanently aligned drives on Esco Ringing Assemblies are other clinching reasons.

Why not find out for yourself why only ESCO Ringing Equipment can give the kind of service that satisfies operators and their subscribers alike. ***Write today for full information.***



Screw adjusted pile-ups



Compact, accessible interrupters

Combination alternators

Lifetime drive motors

"Ready-to-go" pre-wiring

Permanently aligned drives

ADDITIONAL ESCO FEATURES (details in future ads in this series) explain why ESCO components are included in the installations of prominent suppliers like Automatic Electric Co., Federal Telephone and Radio Corp., Kellogg Switchboard Supply Co., Leich Sales Corp., Stromberg-Carlson Co.

ELECTRIC SPECIALTY CO.
176 South Street, Stamford, Connecticut

One-party residence	3.50	4.25
Two-party residence	3.00	3.50
Four-party residence	2.25	2.75
Multi-party rural residence	3.50	4.00

•

Also on Aug. 11, the commission granted a rate increase to the Brooten Telephone Co. which operates an automatic exchange at Brooten serving 208 company owned stations and 145 switch line stations.

Net operating revenues under the old rates were $15,431. With the new rates they will be $18,386. Under the old rates total expenses were $12,395, while with the new rates they are $12,601. Net income under the old rates was $3,036. It is increased to $4,767 with the new rates giving the company a 6.37 per cent return on a rate base of $74,805.

Old and new net rates are as follows:

	Old	*New*
One-party business	$5.50	$6.75
Two-party business	4.75	6.00
Multi-party rural business.	4.75	6.00
One-party residence	3.50	4.25
Two-party residence	3.00	3.75
Four-party residence	2.50	3.25
Multi-party rural residence	3.75	4.25

Lincoln (Neb.) T&T Seeks Fair Return on Investment

The Lincoln (Neb.) Telephone & Telegraph Co. filed an application with the Nebraska Railway Commission on Aug. 11 for an increase in rates.

Merle M. Hale, vice president, said rising costs of doing business had created an imperative need for more revenue. He pointed out that the company had had no increase in rates since 1953.

Specific rates were not requested. Rather, the company asked the commission to set a fair rate of return on its investment.

The application shows that the company's expenses have been materially increased since the present telephone rates were established in 1953. This results principally from five general wage increases since then and from increased taxes and costs of materials.

Mr. Hale said the company's payroll has gone up $1,547,375 or 36 per cent in the last five years. In that period, taxes have increased 55 per cent and prices of major items of materials and equipment all the way from 21 per cent to 30 per cent. These include telephones, poles and iron wire.

To keep up with service demands, the company has been required to add $16,451,288 to its plant and equipment since Jan. 1, 1953, according to the application.

Mr. Hale pointed out that the company's investment had increased much more rapidly than the increase in telephones in the past five and one-half years. Investment has gone up 64 per cent while the number of telephones has increased 21 per cent. As a result the company's investment per telephone has gone up from $248 on Jan. 1, 1953, to $328 today.

Hale said large amounts of new capital must be raised for growth and service improvements. This can be assured only if earnings are at an acceptable level, he stated.

The company operates 135,000 telephones in 125 exchanges in Nebraska.

The above cartoon caricatures the nightmares that a central office equipment installation supervisor goes through during the nights just preceding a cut-over. —Drawn by Thomas R. Nickerson, employe in the Monrovia, Cal. central office equipment department of California Water & Telephone Co.

General of the Southeast Asks Rate Raise in N. C.

The General Telephone Co. of the Southeast notified the Durham, N. C., city council on Aug. 11 that it is applying to the North Carolina Utilities Commission for rate increases in its Durham and Creedmoor exchanges which would bring it an additional $394,792 a year.

The company pointed out that its net income would increase only $164,352 a year under the proposed rate increases but it must ask for $394,792, "the difference being the effect of local, state and federal taxes."

The proposed rate changes relate primarily to exchange services, the company said, expressing the opinion they are justified because of "added investment, higher wage levels, increased taxes and cost of materials, and other increased costs of operation experienced over the past several years."

It said it proposes to expand its "base rate" area, which would result in lowering of mileage charges to telephone subscribers outside the city limits now receiving one, two and four-party service, and estimated that its loss in revenues because of this expansion would amount to $27,996 per year.

Revenue increases sought total $410,023 in Durham and $13,027 in Creedmoor, or a total of $423,050, but subtracting the anticipated loss of $27,996 in revenues because of the "base rate" area expansion, the net revenue increase would be $394,792.

Of the increase sought in Durham, $27,921 would come from residence telephones and $137,101 from business telephones. Of the increase sought in Creedmoor, $8,232 would come from residence service and $4,795 from business service.

The Durham Telephone Co., which was taken over by General Telephone, was granted a rate increase totaling $96,667 in May 1956 after asking for $202,683. The city of Durham opposed the request then and hired an outside rate expert to assist it in opposing the filing before the commission.

Rate Increase Approved For La. Independent

The Louisiana Public Service Commission recently approved a rate increase for the Kaplan Telephone Co.

No hearing was necessary because the company presented a petition from

the subscribers agreeing to the raise. A total of 92 per cent of the company's subscribers affected by the rise in rates signed the petition.

Only the 1,219 local subscribers are involved. No raise was asked for the 525 rural subscribers.

Old and new rates are as follows:

	Old	*New*
One-party residence	$3.50	$4.20
Two-party residence	2.75	3.40
Four-party residence	2.25	2.85
One-party business	7.50	8.40
Two-party business	6.50	7.40

Lytle C. Turnley, president and general manager of the company said that it is launching a $75,000 expansion and service improvement program. The company is presently working on a $40,000 program to extend rural service and provide facilities for additional local subscribers.

The company plans to spend $34,787 in September for the purchase and installation of new automatic central office equipment to provide service for about 500 additional subscribers.

Cal. Independent Seeks 6.9 Per Cent Return

The Roseville Telephone Co. has filed a petition for a rate increase with the California Public Utilities Commission, it was reported on Aug. 5.

Robert Doyle, company president, said the rate increase proposal before the commission is designed to give the company a 6.9 per cent return on its investment, compared to earnings of 3.5 per cent last year.

He pointed out that the company's investment has increased from $500,000 in 1953 to 2.5 million dollars in 1958.

The last rate increase granted the company was in 1953.

W. Va. Company Granted $11,428 Rate Raise

The West Virginia Public Service Commission on Aug. 4 granted an $11,428 rate raise to the Grantsville Citizens Telephone Co. (TELEPHONY, July 19).

The company services 540 subscribers through exchanges at Grantsville and Arnoldsburg.

Rates for one-party residence service increased from $2.00 to $4.00 and for one-party business service from $2.50 to $7.00.

Authorize Sale In Alabama

The Alabama Public Service Commission on July 24 granted permission to the Lincoln Telephone Co., Inc., to sell its property to the Coosa Valley Telephone Co., Pell City.

TELEPHONE COMPANIES

Use this fast portable trencher for cable, pipe, tubing, conduit

POW-R-SPADE narrow trenches cost 1c to 5c per foot including labor.

•

Saves 80% - 90% cost and time compared to subcontract or hand digging.

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Ready to go on the job, at once — no costly waiting around.

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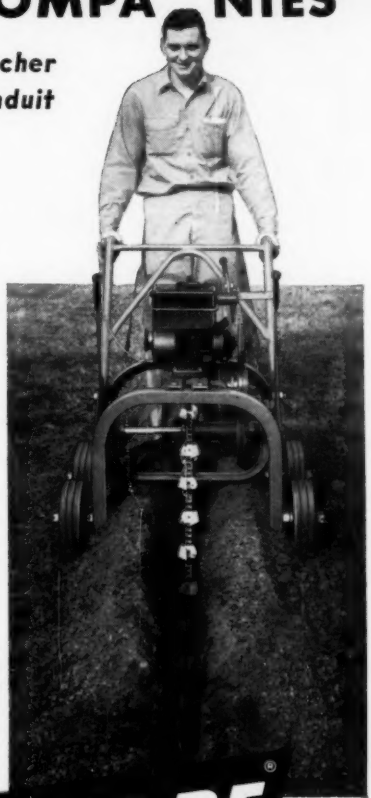
Can pay for itself in one day's operation.



POW-R-SPADE digs a neat 3" wide trench. Dirt is delivered well pulverized on each side of trench — no lumps or clods. Easy to back fill.

STAMPINGS

POW-R-SPADE®

MADE BY STAMPINGS, INC.
Davenport, Ia.

Portable from job to job. Easily handled by one man.

APPROVED and recommended by hundreds of users in every area of the United States.

Get more facts about the earning power of POW-R-SPADE.

WE ADMIT that these are strong statements. And yet, POW-R-SPADE users confirm them again and again. For here is a machine that is ideal for trenching 3" wide to 24" deep, where larger machines are costly and impractical; where hand labor is slow and expensive. No heavy wheel marks or unnecessarily wide trench to scar lawns. Digs right up to foundation of building. Goes 1½ to 17 feet per minute, depending upon soil conditions.

A rugged machine. Easy to set and to operate. Oil-sealed bearings. Powered by a well-known engine. Minimum maintenance. Shipped completely assembled, ready to go to work for you. Additional interesting details and information immediately yours upon return of the coupon.

Stampings, Inc., 1017 Mound St., Davenport, Iowa

Please send literature on POW-R-SPADE to:

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Company_____

Street_____

City_____ State_____

Left Photo: Front of new warehouse (left) and headquarters built by Alabama Telephone Co. in Fayette. Right Photo: W. J. Holladay, general manager, who announced the company has completed new central office buildings and equipment, and new outside plant, both urban and rural, at the following Alabama towns: Berry, Fayette, Gordo, Guin, Haleyville, Sulligent and Vernon. The same rehabilitation is scheduled for Aliceville, Carrollton and Reform, Ala., during August. Construction is under way at Hamilton and Winfield, Ala., and is to be completed early in 1959.

Bell Ask Raise In N. M., General of SW Drops Request

The Mountain States Telephone Co. on Aug. 4 filed with the New Mexico Corporation Commission proposed increased rates amounting to $277,600 yearly in eight communities.

The raise to be effective, Sept. 4, was proposed for Alamogordo, Tularosa, Cloudcroft, Las Cruces, La Mesa, Farmington, Grants, and Aztec.

The rate increases were posted on the company's contention, upheld in other cases several months ago by a two member commission majority, that a 1954 general rate order made provision for automatic rate stepups in certain instances where an exchange grows beyond certain breakover points.

Chairman James F. Lamb of the New Mexico Corporation Commission said that the new schedules had been filed and that commission members would determine whether any hearings or investigations would be held. He added that if the commission did not oppose the new rates, they would automatically become effective in September.

Present and proposed rates for all exchanges except Grants are as follows:

	Present	*Proposed*
One-party business	$12.25	$14.15
Two-party business ...	8.40	9.20
One-party residence ...	5.05	6.25
Two-party residence ...	4.10	5.00
Four-party residence ...	3.35	3.85

For Grants, present and proposed rates are:

	Present	*Proposed*
One-party business	$9.60	$11.00
Two-party business	6.25	7.20

Say mister, is this pole gonna be here from now on?
TC
Maybe not from now on, but it will last for years and years. That is unless it's struck by lightning or something. This is a T-C pressure treated pole. T-C's pressure treatment makes 'em last. Our company uses T-C poles all the time. We found they last . . . almost from now on.
Distributed by
AUTOMATIC ELECTRIC SALES CORP.
AND LEICH SALES CORP.
TAYLOR-COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA
PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

One-party residence ...	4.35	4.60
Two-party residence ...	3.40	3.65
Four-party residence ...	2.65	2.90

•

Also in New Mexico, the General Telephone Co. of the Southwest withdrew its request to raise its rates for service connection moves and changes, it was reported on Aug. 5 (TELEPHONY, July 26).

The company had asked to raise its rates by $23,900 annually.

Commissioner James F. Lamb said that the company probably would file an amended schedule for new charges at a later date. These new charges would conform more closely with those in other communities, Mr. Lamb said.

Nebraska Company Receives Increase of $94,290

The United Telephone Co. of the West, Scottsbluff, Neb., on Aug. 11 was granted by the Nebraska Railway Commission authorization to increase its rates so as to produce an additional $94,290 a year in gross revenue from its Nebraska intrastate operations.

The company sought a $176,952 increase but the commission said this would be excessive.

United Telephone was ordered to submit for commission approval a schedule of rates which would produce the additional revenue authorized.

The firm, which serves Nebraska and Wyoming areas, made its application on Apr. 21.

The company has received no rate increase since 1927 and has a "very substantial construction program" under way in the state, it observed.

Last year's Nebraska earnings of $92,906.33 were "not sufficient to constitute a fair return on the property used."

Nine General of SW Tex. Exchanges Get Raises

The following rate increases became effective in Texas exchanges of General Telephone Co. of the Southwest during the month of July:

Matador, C. B. Manual	*Old*	*New*
409 Stations July 6		
One-party business	$9.50	$11.00
Two-party business ...	8.00	9.50
One-party residence ...	5.25	5.75
Two-party residence ...	4.25	4.75
Four-party residence ..	3.50	4.00
Darrouzett, Automatic		
97 Stations July 1		
One-party business	8.00	10.00
Two-party business ...	6.25	8.00
One-party residence ...	4.50	5.50
Two-party residence ...	3.50	4.25
Baytown, Automatic		
12,270 Stations July 6		
One-party business	11.00	14.00

Telephone duct goes down faster, easier, when it's

BERMICO®

FIBRE CONDUIT

Lays faster than other duct with less labor. Lightweight 8-foot lengths easily cut and tooled on the job speed installation. No alignment problems. No bandaging, compounds or other adhesive materials required.

Complete line of fittings quickly solve the most difficult installation problems. Bends, Elbows, S-Bends, Curved Segments, Angle-couplings, Plugs, Caps, Manhole Bells, Flexible Duct, are available.

Smooth inside bore for quick, easy "pull throughs" without danger of abrasion. Precision-milled tapered joints are sealed tight with a few hammer taps.

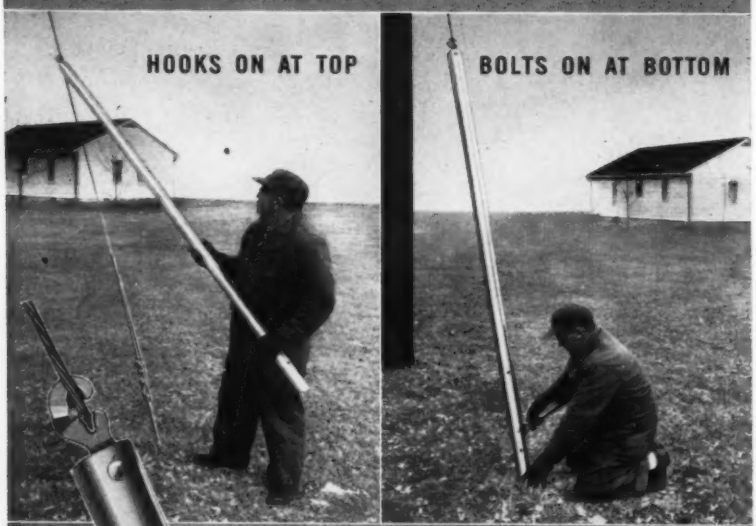
Waterproof — strong — acid resistant. This tough cellulose fibre conduit is thoroughly impregnated with coal tar pitch, making it exceptionally waterproof, durable and chemically inert. Concrete usage is cut to a minimum utilizing removable vertical separators.

BROWN COMPANY

General Sales Offices:
150 Causeway Street, Boston 14, Mass.
Mills: Berlin, N. H.; Corvallis, Ore.

Distributed by WESTINGHOUSE Electric Supply Company
Offices in principal cities

Question: What makes the CHANCE 808 GUY GUARD the groundman's preference?



Answer: Ease of Installation!

Guy Guards that are easy to install are easy to get installed where and how you want them. The Chance 808 is an inexpensive guy guard designed for fast, easy installation. Even a midget can install it—there are no high bolts to fasten at the top—only one bolt at the bottom.

The 808 hooks easily around the guy wire at the top. The hook binds to hold tight when bottom of guard is brought into position. Hook holds guard away from wire to eliminate noisy vibration. Flanged edges of hook prevent strand cutting, and help to keep guard in position.

Single bolt at lower end of guard fastens to guy rod . . . or to guy wire . . . or to guy loop. You get proper installation every time.

Economical too!

The Chance 808 is economical in first cost . . . in labor costs . . . and in service. It is made of heavy gauge steel, hot dip galvanized for long life and high visibility. Edges are turned in for extra safety and rigidity.

The Chance 808 Design is also available in ALUMINUM.

A·B·CHANCE CO·
CENTRALIA, MISSOURI
(A. B. Chance Co. of Canada, Ltd., Toronto)

CP58-AA

Two-party business	8.00	11.00
One-party residence	5.10	6.50
Two-party residence	4.65	5.50
Four-party residence	3.85	4.50
Eden, Conversion to Automatic		
502 Stations July 2		
One-party business	8.00	10.50
Two-party business	6.50	8.50
One-party residence	4.25	5.25
Two-party residence	3.75	4.50
Four-party residence	—	4.00
Bacliff, Automatic—EAS		
467 Stations July 6		
One-party business	11.00	12.50
Two-party business	9.50	10.50
One-party residence	6.00	6.25
Two-party residence	5.00	5.25
Four-party residence	4.24	4.50
Kemah, Automatic—EAS		
456 Stations July 11		
One-party business	11.00	12.50
Two-party business	9.50	10.50
One-party residence	6.00	6.25
Two-party residence	5.00	5.25
Four-party residence	4.25	4.50
League City Automatic—EAS		
1,115 Stations July 16		
One-party business	11.00	12.50
Two-party business	9.50	10.50
One-party residence	6.00	6.25
Two-party residence	5.00	5.25
Four-party residence	4.25	4.50
Dickinson Automatic—EAS		
1,803 Stations July 26		
One-party business	11.00	12.50
Two-party business	9.50	10.50
One-party residence	6.00	6.25
Two-party residence	5.00	5.25
Four-party residence	4.25	4.50
Bloomington, Conversion to Automatic		
240 Stations July 30		
One-party business	6.50	9.50
Two-party business	5.50	8.00
One-party residence	4.00	5.25
Two-party residence	3.50	4.25
Four-party residence	—	3.50

N. C. Company Asks Increase For Dial Service

The Pinebluff Telephone Co. on Aug. 13 asked the North Carolina Utilities Commission for permission to increase its rates by $2,142 a year, stating that it now is losing about $5,000 a year after depreciation.

The company, which serves 345 customers, put a new automatic system into operation Dec. 1, 1957, making two REA loans, one in the amount of $132,000 and the other for $29,000.

The company told the commission it needs $32,000 more to finance the $171,600 cost of the new facilities.

Ask OK to Buy Three in Neb.

A Sept. 9 hearing date has been set on the request of the Northeast Nebraska Telephone Co., South Sioux City, to buy the Citizens Telephone Corp., Malmo, and the Coleridge Telephone Co. and to acquire the Linwood Telephone Co. by abandonment agreement. The company also asked permission to issue securities and obtain a loan.

Bell Labs Tries Out New Coin Telephone in N. J.

An experimental coin telephone, which uses beeps instead of gongs and chimes, and is distinguished by its modern-looking box is undergoing several months of public trial at Woodbridge, N. J.

Developed by Bell Telephone Laboratories, which is conducting the test in cooperation with New Jersey Bell Telephone Co. the sleek new model has been installed in a dozen heavily used locations to try out the changes and see how people react to them.

The major feature of the trial telephone is the elimination of the usual gong and chime which sound when coins are deposited. They have been replaced by an electronically-generated signal that gives one "beep" when a nickel is deposited, two when a dime or two nickels are put in, and five when a quarter is inserted. Use of this new signal, which employs a transistor for operation, is anticipated for future Bell System pay telephones.

Another important feature is the introduction of one vertical edge-on slot, located at the upper front of the box, which will accept nickels, dimes, and quarters. It eliminates the three coin slots that have been on Bell System coin telephones for more than 50 years.

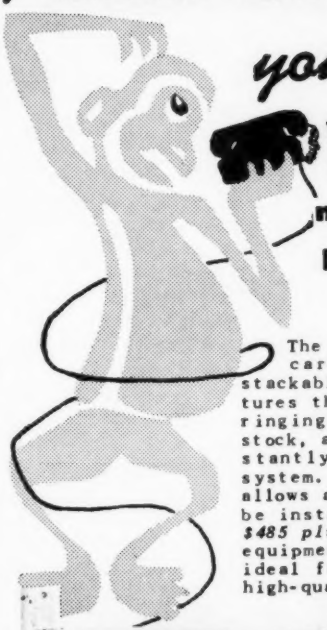
Extending across the front of the box, just below the single slot, is a new coin return bar that is the equivalent of the push button seen on pay telephones for several years.

The information card has been removed from its perch atop the box and is attached to the front at eye level.

The familiar "sunflower" dial number plate has been replaced by the clear

This experimental coin telephone has been installed in a dozen locations by New Jersey Bell. Mrs. Darleen Olsen, a business office supervisor for the company at Woodbridge, is shown using one of the new instruments.

Private Line Service got you bamboozled?

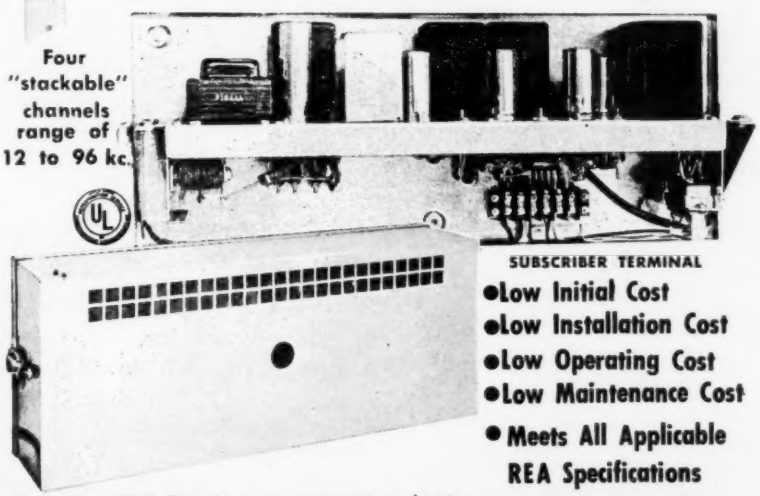


you can provide service easily and quickly on most existing lines with LOW-COST BUDELMAN Type PLC Carrier!

The type PLC Carrier is the lowest cost carrier commercially available. It is stackable to 4 channels and, in design, features the heart of type 16B fully selective ringing carrier. By carrying a channel in stock, a new private line circuit can be instantly provided almost anywhere in your system. The complete simplicity of the PLC allows a profitable private line service to be installed for an equipment cost of only *$485 plus voice pass filters!* Since the PLC equipment is completely recoverable, it is ideal for emergency, temporary, or seasonal high-quality private line service.

CENTRAL OFFICE TERMINAL

Four "stackable" channels range of 12 to 96 kc.



SUBSCRIBER TERMINAL

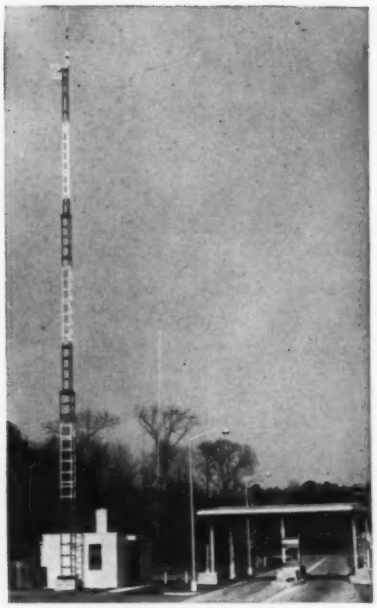
- Low Initial Cost
- Low Installation Cost
- Low Operating Cost
- Low Maintenance Cost
- Meets All Applicable REA Specifications
- Easily Removable for Re-installation
- Crystal-Controlled Oscillators

By using PLC Carrier on present private line circuit you can free that line to be used for multi-party subscribers.... get full use from your facilities. PLC is also adaptable for providing additional trunk lines to distant PBX, PABX and key telephone systems.

WRITE FOR CIRCULAR *758-B*

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. COLUMBUS 21, OHIO



Communication's Most Versatile Tower . . . the STAINLESS "SC" (Self-Supporting)

- Clean, economical, dependable structure
- Serves many purposes
- Space-saving uniform cross-section
- Easy to erect
- "Natural ladder" construction affords easy maintenance

Quick, expeditious handling of communications is assured year-'round by this clean, economical and dependable self-supporting structure.

The SC Tower is sturdy, and being free of guy cables is particularly adaptable where land space is at a premium.

Available as straight uniform cross-section for short heights, graduated uniform cross-sections for taller use.

Call or write for details.

Stainless, inc.
NORTH WALES • PENNSYLVANIA

plastic finger wheel now on many of the newer telephones.

The upper front of the box is sloped slightly to make reading easier. The box itself remains black except for the front, the handset and cord which, on the trial models, are grey.

The experimental model was created in the station apparatus development department of Bell Laboratories. In charge of the project is George A. Wahl, station apparatus development engineer. The project has been carried on by one of his groups under the supervision of William Pferd.

Report Survey of Telephone, Telegraph Industries

Employing approximately 110,500 persons in 74 plants, the telephone and telegraphic equipment industry attained an estimated volume in 1957 of 1.4 billion dollars in value of products shipped, according to the second annual Survey of Industrial Buying Power published by *Sales Management* magazine.

The distribution by counties of employment in the industry is indicated for the first time by the new survey, which ranks each of nearly 450 separate industries as defined by the U. S. Census Bureau's Standard Industrial Classification. For each of these industries, it shows the number of plants and total employment for the nation's top 20 counties, which in most cases account for more than half of total employment.

Cook County, Ill., was found to be the nation's leading telephone and telegraphic equipment county, approximately 50,800 persons being employed in 13 plants.

The nation's top 20 telephone and telegraphic equipment counties are shown to contain 51 plants, representing 68.9 per cent of the industry total.

Reorganize Columbia Utilities, Dean President

Earl R. Dean, president, Oregon-Washington Telephone Co., Hood River, Ore; was elected president of Columbia Utilities Co., Medford, Ore. and California-Oregon Telephone Co., Tullake, Cal. at meetings of the boards of directors on Aug. 2.

The reorganization and coordination of United Telephone System operations in the Pacific Northwest under Mr. Dean's direction also included the election as directors of the Columbia and California-Oregon companies of Mr. Dean, D. O. Hood, E. R. Hood, Alden L. Hart, and J. T. Naylor.

J. S. Middleton of Portland, Ore. was elected secretary-treasurer and John W. Kirby of Medford, Ore., was elected vice president and general manager. James M. Kirby was elected assistant treasurer and W. E. Driscoll was elected auditor and assistant secretary.

Telephone Industry in Ind. Featured in State Magazine

The telephone industry in Indiana came in for a pat on the back when it was featured in a recent issue of the new magazine, *Indiana Business and Industry.*

George A. Schumacher, general manager of the Indiana Telephone Association, authored an article tracing the progress of the telephone industry in Indiana. He mentioned that the state is now served by 210 different companies operating approximately 1.7 million telephones. Approximately 73 per cent of the land area of Indiana, he said, is served by Independents, while the remaining 27 per cent is served by the Indiana Bell and Illinois Bell Telephone Cos.

The functions of the Indiana Telephone Association and the USITA were explained by Mr. Schumacher as were the telephone industry's tradition of service.

Photos of the officers and directors of the Indiana Telephone Association were also included.

Thumbnail sketches were given of various well-known figures including Hugh A. Barnhart, president of the Rochester Telephone Co.; Dr. Byron K. Trippett, president of Wabash College and son of S. K. Trippett, president of the Princeton Telephone Co.; L. H. Meyer, president of General Telephone Co. of Indiana, and Earl Schooley, vice president and general manager of Indiana Bell.

The three largest companies in the state were featured in separate articles on their history, present service accomplishments, and future plans. Chronicled in this manner were the United Telephone Co. of Indiana, Inc., serving 74 exchanges, The General Telephone Co. of Indiana, which now has over 300,000 telephones in service, and Indiana Bell Telephone Co. which handles 133,000 outgoing long distance calls daily.

Attractive full page picture layouts of the United Telephone Co. of Indiana, Inc. and the General Telephone Co. of Indiana highlighted the story of each company's activities.

Surmount All Difficulties

It is a part of American character to consider nothing as desperate; to surmount every difficulty by resolution and contrivance.—THOMAS JEFFERSON

ANACONDA STALPETH

Paper-insulated telephone cable that's 30 to 50% lighter!

Save on initial costs . . . on shipping, installation, maintenance.
Offers all the advantages of Paper-lead Cable Plus

New Economy!

Right off, Anaconda Stalpeth saves you money in initial cost. Its lighter weight saves you more on freight charges. You cut installation costs. Its light weight is of tremendous help for fast aerial installations. Stalpeth also simplifies the problem of pulling through ducts. Stalpeth goes right on saving you money, for its dependability, electrical and mechanical properties eliminate many maintenance problems.

New Light Weight!

Stalpeth is 30% to 50% lighter than paper-lead cable because the light-weight sheath is STeel, ALuminum and Poly-ETHylene rather than heavy lead. The result: new ease and economy in both installation and maintenance!

New Dependability!

Each conductor for Stalpeth is individually inspected as it comes out of the insulating machine. In addition, every pair is tested. Thorough in-process control eliminates need for costly, time-consuming field inspection.

New Outstanding Features!

Stalpeth offers many advantages: (1) The polyethylene jacket offers electrical protection from falling power lines. It prevents power faults which could damage lead-sheathed cable. (2) Stalpeth's high-molecular-weight polyethylene jacket prevents corrosion problems frequently met in duct installations. (3) The electrical characteristics of Stalpeth have been engineered to the high standards of all Anaconda cable: minimum conductor resistance . . . high insulation resistance . . . maximum dielectric strength . . . low resistance shield—*traditional paper quality with new economical lightweight sheath.*

New Service!

Anaconda is the independent telephone cable manufacturer to the independent company. Behind this manufacturer stand 50 years of experience in the production of paper-insulated cables. And today the latest in manufacturing equipment and testing devices, and telephone-experienced personnel join forces to bring you top-quality Stalpeth. Distribution points across the country assure you fast delivery and service.

Facts for your files . . . on

ANACONDA STALPETH

APPLICATION · CONSTRUCTION · ELECTRICAL CHARACTERISTICS · TABULAR DATA

Application

The modern paper-insulated, light-weight jacket telephone cable for use in exchange areas. It can be installed aerially supported by messenger, or underground in ducts.

Construction

Conductors:

19 AWG	22 AWG	24 AWG	26 AWG
Solid, annealed copper—size No. 19 Awg 16 pairs—455 pairs	Solid, annealed copper—size No. 22 Awg 26 pairs—909 pairs	Solid, annealed copper—size No. 24 Awg 51 pairs—1515 pairs	Solid, annealed copper—size No. 26 Awg 51 pairs—1818 pairs

Insulation: Single-wrap paper tape applied with an overlap

Color Coding: Standard color groups as shown on next page

Cable Assembly:

The insulated conductors are twisted into pairs having 10 different pair twists.	The insulated conductors are twisted into pairs having 5 different pair twists.

The pairs are stranded into units. The units are assembled as shown on following page. The cable core is covered by two thicknesses of paper tape.

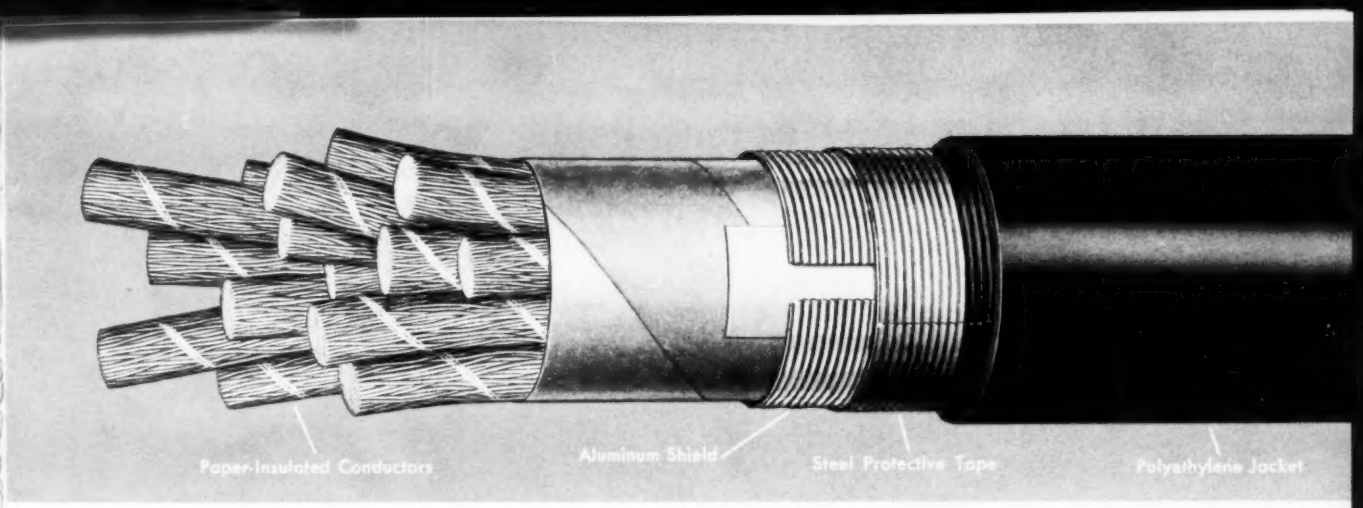
Sheath: The Stalpeth sheath is composed of aluminum tape, tinned-steel tape and a high-molecular-weight polyethylene jacket overall.

The inner .008-inch aluminum tape is applied longitudinally with a slight gap, corrugated for flexibility in large diameter cables. The low d-c resistance of this tape when properly grounded limits the effect of induction from power lines and reduces possibility of damage to cable from lightning.

The outer .0072-inch corrugated tinned-steel tape is also applied longitudinally, but with an overlap, and is soldered to form a tight metallic seal. It provides maximum protection to the cable core against possible moisture diffusion through the outer polyethylene jacket.

The outer jacket is composed of high-molecular-weight polyethylene which is highly resistant to abrasion, weathering, moisture, corrosion and environmental cracking.

Shipment: Each length is wound on a separate reel, with each end sealed to prevent entrance of moisture. Each reel is fully lagged.



Electrical Characteristics

	19 AWG	22 AWG	24 AWG	26 AWG
Conductor Resistance: ohms/mile, maximum	46	92	145	230
Average Mutual Capacitance: mf/mile at 1 kc, maximum	0.090	0.090	0.090	0.090
Insulation Resistance: megohm-miles, minimum	500	500	500	500
Dielectric Strength: Insulation capable of withstanding for 2 seconds an a-c rms voltage—				
Conductor to Conductor	500	350	350	350
Conductor to Sheath	1000	1000	1000	1000

Tabular Data

19 AWG

Number of Pairs	Guaranteed Number of Pairs	Approximate Overall Diameter	Approximate Net Weight	Shipping Weight	Standard Reel Length
		inches	lb per ft	lb per M ft	feet
16	15	.7	.2	300	4500
26	25	.8	.3	430	4500
51	50	1.1	.6	790	3000
76	75	1.3	.9	1170	2200
101	100	1.5	1.2	1700	2200
152	150	1.7	1.7	2230	1400
202	200	1.9	2.2	2830	1400
303	300	2.3	3.2	4000	900
404	401	2.7	4.3	5800	800
455	452	2.8	4.8	6300	800

22 AWG

Number of Pairs	Guaranteed Number of Pairs	Approximate Overall Diameter	Approximate Net Weight	Shipping Weight	Standard Reel Length
		inches	lb per ft	lb per M ft	feet
26	25	.7	.2	300	4500
51	50	.8	.3	430	4500
76	75	1.0	.5	680	4500
101	100	1.1	.6	790	3000
152	150	1.3	.9	1170	2250
202	200	1.5	1.2	1700	2250
303	300	1.7	1.7	2230	1500
404	400	1.9	2.2	2830	1200
455	451	2.1	2.6	3400	1000
606	601	2.3	3.2	4000	1000
909	903	2.8	4.7	6200	800

24 AWG

Number of Pairs	Guaranteed Number of Pairs	Approximate Overall Diameter	Approximate Net Weight	Shipping Weight	Standard Reel Length
		inches	lb per ft	lb per M ft	feet
51	50	.7	.2	300	4500
76	75	.8	.3	430	4500
101	100	.9	.4	530	4500
152	150	1.1	.6	530	3000
202	200	1.2	.8	1070	2250
303	300	1.4	1.1	1420	2250
404	400	1.6	1.4	1900	1500
606	600	1.9	2.1	2900	1000
909	900	2.2	3.0	3800	900
1212	1200	2.5	3.9	5020	800
1515	1500	2.8	4.9	6400	800

26 AWG

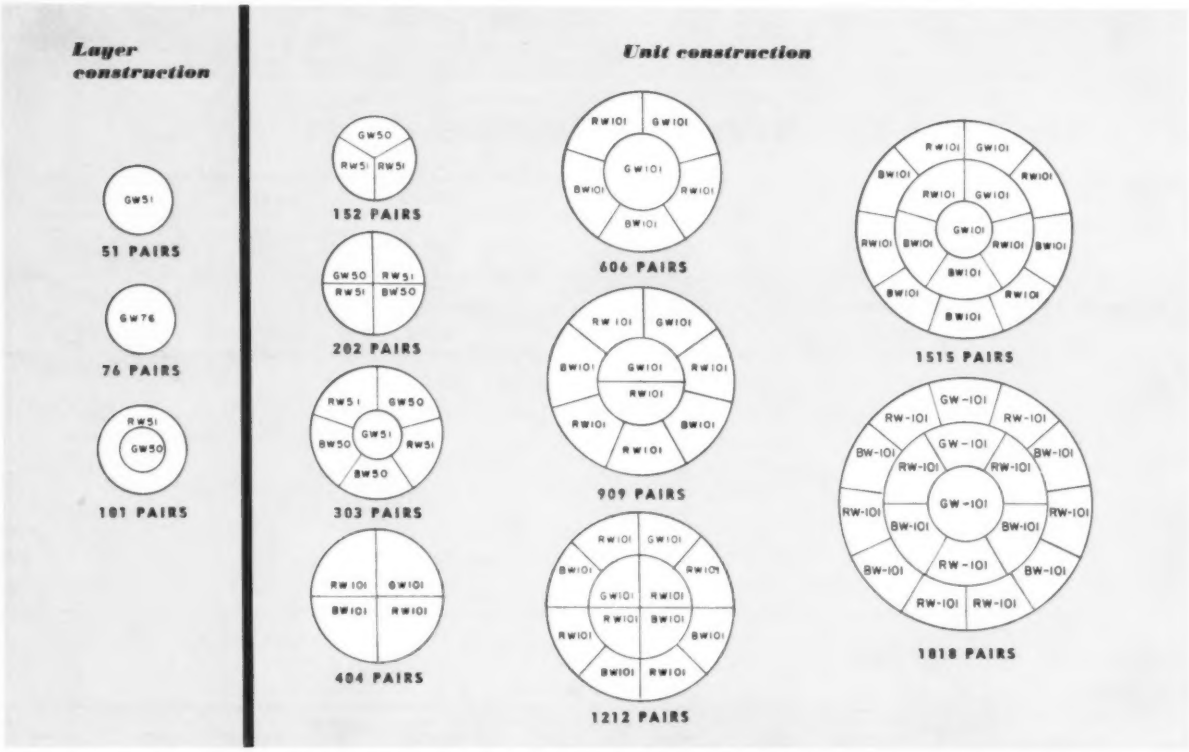
Number of Pairs	Guaranteed Number of Pairs	Approximate Overall Diameter	Approximate Net Weight	Shipping Weight	Standard Reel Length
		inches	lb per ft	lb per M ft	feet
51	50	.6	.2	290	4800
76	75	.7	.3	400	4800
101	100	.8	.4	520	4800
152	150	.9	.5	650	3200
202	200	1.0	.6	790	3200
303	300	1.2	.9	1170	2400
404	400	1.4	1.1	1420	1600
606	600	1.7	1.5	2060	1400
909	900	2.0	2.2	3000	1100
1212	1200	2.2	2.9	3700	900
1515	1500	2.5	3.6	4880	800
1818	1800	2.7	4.2	5940	800

Facts for your files . . . on

ANACONDA STALPETH

CABLE CONSTRUCTION

Cable Assembly



The numbers in the assemblies denote the number of pairs in the layer or unit. The letters refer to the color of the pairs in a layer; or in the case of a unit, to the outside pairs of the unit. GW, green-white; RW, red-white; BW, blue-white. The units are further distinguished by a color-coded binder string.

That's the story—inside and out—on Anaconda Stalpeth. If *you're* in the market for paper-insulated telephone cable, check light-weight, economical Stalpeth. Available from 16 to 1818 pairs. Call the Man from Anaconda today. He will be glad to give you full information on Stalpeth—or any of Anaconda's full line of telephone cables, pictured below and available from 6 to 2121 pairs. Write for Bulletin DM-5771, containing complete technical data on Stalpeth, to: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

Call the Man from

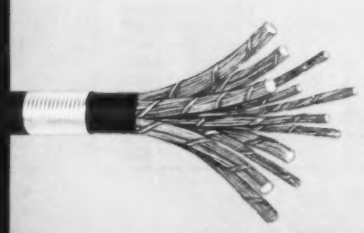
ANACONDA®

for **STALPETH**

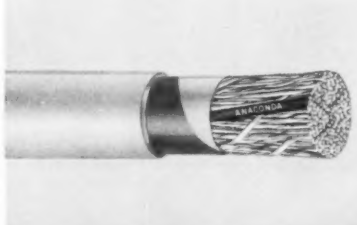
PAPER-INSULATED TELEPHONE CABLE

the independent manufacturer to the independent telephone industry

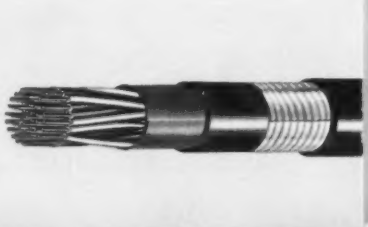
Anaconda Alpeth plastic telephone cables. Fully color-coded, new light weight. Polyethylene-insulated, low-resistance aluminum shield, polyethylene jacket.



Anaconda paper-lead telephone cables are available in all standard types: polyethylene-protected, jute-protected, Buried-Tape-armored, gopher-protected.



Direct Burial Cable with double polyethylene jacket and metallic-tape shield. Type PCP is standard construction. Type PCPG has heavier shield—for areas subject to rodent attack.



THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

TIME MARCHES on and the telephone industry marches on with it. Operating practices are constantly being revised to keep pace with progress and to make the service more efficient and pleasing to the customer.

One of the more recent revisions covers a new practice for offering option to the calling party when person delays are encountered on long distance calls.

The new practice provides that when a person delay is encountered in which the called party will, or may be, available sometime today, the operator determines the wishes of the calling party as to whether she should leave word, or whether he would prefer to place his call again.

If he wishes word left, the operator does so, but makes no voluntary subsequent attempt on the call. If the calling party asks the operator to try the call later, she complies with the request. If the customer prefers to place his call again, the call is canceled.

In dismissing the calling party after leaving word at his request, the operator suggests that he may wish to place his call again, if the called party does not respond to the leave word message; this avoids leaving the customer under the impression that further voluntary attempts will be made by the operator.

This extension of the option principle to person delay situations seems a natural way to make the service more sensitive to customer needs and desires. The elimination of voluntary subsequent attempts appears to be a solution to certain service problems encountered under former procedure.

Occasionally, when an operator attempts to complete a call on a subsequent attempt, she finds that the call has already been talked on. Such occurrences cause critical comment from both calling and called parties and are wasteful of customer and operator time.

This condition is created by WH completion just prior to the subsequent attempt time, or by failure to match WH tickets with original tickets in time to stop the subsequent attempt. Furthermore, in some cases calling customers dislike getting subsequent reports of delay prior to actual completion, and some called customers object to continued follow-up by the operator after they have accepted a leave-word message.

In addition to the foregoing service advantages, the elimination of voluntary subsequent attempts will probably effect an over-all reduction in line operator work. Also, the requirement for matching WH tickets with original tickets is largely eliminated since the original ticket is no longer active in most cases after the connection is released following the offer of option. In the Illinois Bell area, only WH tickets from Illinois points will be matched with the original in order that the report charge may be canceled.

Following through on the operating routine in reaching the called party when he is expected today, or not known whether he will be there today, the operator will say to the calling party, "Would you prefer to place your call again or shall I leave word for Mr. (called party) to call me?"

If the calling party wishes the operator to leave word, she will do so, and will clear the circuit and cancel the ticket. The operator will say to the calling party, "I'll call you when Mr. (called party) reports. However, if he does not report, you may wish to place your call again later." The operator will enter operator (no.) at the top of the ticket and send it to the ticket position.

On calls which involve a report charge, the operator will add, "Due to the report charge on the call, ask for long distance operator 9."

If the calling party will place his call again, the operator will say to the person at the called telephone, "The calling party will call later," and will cancel the ticket.

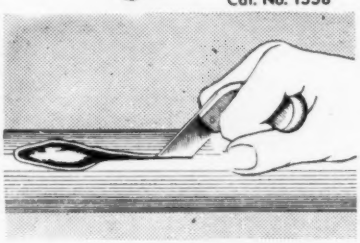
If the calling party wishes the operator to try later, the operator will enter the subsequent attempt time on the ticket and will send it to the ticket position.

It is always well to keep in mind, before new practices are introduced

NEW KLEIN
stripping tool
for all types of
control cable

Patents 2398979
2691822

Cat. No. 1558



Here is a new tool developed by Klein, designed to strip insulation from all types of control cable, flexible cords, PWC, telephone cable with vinyl or polyethylene jackets and bus drop.

Handle of cast aluminum, light in weight and with convenient grip; knife of tempered tool steel may be sharpened and is easily removed for replacement. This tool strips insulation from a few inches to as many feet as desired swiftly and simply. Does not damage conductors inside weatherproof sheath.

Write for bulletin giving complete information.

FREE POCKET TOOL GUIDE

A free copy of the new Klein Pocket Tool Guide will be sent on request without obligation.

ASK YOUR SUPPLIER

Foreign Distributor:
International Standard
Electric Corp.
New York

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

"Super-Splice"®
makes splices
waterproof
...from
inside out!

Superior Cable's exclusive economical "Super-Splice" is a plastic splice sleeve. It is sealed at one end and comes to you filled with an insulating and waterproofing compound.*

"Super-Splice" prevents leakage currents and breakdowns in the presence of moisture . . . good for 25,000 v. d. c.

Can be easily removed to reenter the splice . . . the compound never hardens or oozes out no matter what the temperature.

*A Dow-Corning silicone compound.

"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE
SUPERIOR CABLE CORPORATION
Hickory, North Carolina

or revised, that careful consideration is given to the new or revised practice and, in some instances, they are used in a particular area on a trial basis before they are incorporated in the Toll Operating Practice.

It is always well for a chief operator to accept a new or revised operating practice with an open mind, giving the practice a fair trial. If the chief operator is convinced the practice is not a suitable one, she can always give this information to someone in her office with an explanation of why she deems the practice unsatisfactory. She shouldn't just say, "This practice won't work," if she has no information or facts to back up her statement.

A chief operator's opinions are always welcomed by management and, in some instances, a practice has been revised to make the service more satisfactory to the customer on the basis of the chief operator's experience and opinion. These cases are not common because, as previously stated, careful consideration to all phases of a situation is given before introducing a new operating practice or revising a former practice.

To keep up to date on new and revised operating practices, it is essential that the chief operator and her supervisory staff study the new or revised instruction, see that it is passed on to the operating force, and properly filed in the Toll Operating Practice. If the instruction is put aside, it may never be placed into effect. Many operating practices involve other offices, as well as your own, and all exchanges must operate on a uniform basis if service is to be satisfactory to the customer and toll circuit usage is to be kept at a minimum. Know your Toll Operating Practice and follow it.

Traffic Questions

(1) On an aircraft flash call, if an operator receives a request to verify a filter center line, how should she proceed?

(2) When an operator receives a disconnect signal from the called telephone on an aircraft flash call, what action should be taken by the operator?

(3) In attempting to reach a called party on a long distance call, if a report is received that the called party is expected today or it is not known whether he will be there today, what should the operator say to the calling party?

(4) In the foregoing condition, if the calling party wishes the operator to leave word, should she do so?

(5) In the foregoing condition, if the calling party will place his call again, what should the operator say to the person answering at the called telephone?

Answers are presented on page 64.

H. L. Gerrish Retires, Becomes Utility Consultant

Harold L. Gerrish, who retired on Aug. 15 after 30 years' service as chief of the electric and telephone division of the Maine Public Utilities Commission, has entered private practice as a public utility consultant.

He is a graduate of the University of Maine in electrical engineering and an associate member of American Institute of Electrical Engineers. He started his career as engineer and manager of the Milo Light & Power Co., and since 1928, has worked in public utility regulation.

In 1947-48, Mr. Gerrish was responsible for the administration of power supply in Maine during a severe water shortage, while that area had no interconnection with other states under the Fernald law. He arranged with the U. S. Navy to provide an emergency supply of power from ships over a period of five months.

He served as chairman of the National Conference of Commission Engineers and also as a member of the National Association of Railroad and Utility Commissioners (NARUC) Engineering Committee. He has been an active member of the several committees developing separations procedures for settlement of the Bell system revenues between state and interstate, and was chairman of a NARUC committee on procurement and training commission engineering personnel.

He has acted as consultant for the states of New Hampshire, Vermont, Massachusetts and Idaho in Bell telephone rate cases.

Mr. Gerrish plans to remain in Augusta, Me., to provide consulting services on management and finance for utilities in the New England area.

General of Florida Elects Vice President, Secretary

The General Telephone Co. of Florida has elected two new officers and promoted two management employes.

Named new officers were David A. Kafka, former general commercial manager, to the new position of vice president-revenue requirements and treasurer; and Hugh C. Macfarlane, Tampa attorney, to the post of acting secretary and assistant general counsel.

Mr. Kafka, a native of New York and educated in North Dakota and Minnesota, worked for Northwestern Bell Telephone Co. for several years

before joining General of Florida (then Peninsular Telephone Co.) in 1924. He held several commercial posts with the company before becoming general commercial manager early this year.

Mr. Macfarlane, a member of the Tampa law firm of Macfarlane-Ferguson-Allison & Kelly, has been associated with General of Florida for the past eight years as assistant general counsel.

Promoted to succeed Mr. Kafka, as general commercial manager, was Norman M. Shenk, former Tampa commercial manager. Born and educated in Pennsylvania, Mr. Shenk received long and varied telephone experience with Mutual Telephone Co. at Erie, Pa.; Jamestown (N. Y.) Telephone Corp. and several companies of the former Investors Telephone Co. He began working with Florida General in 1944 as assistant general commercial superintendent and later became Tampa commercial manager.

Promoted to the position of assistant controller was Joseph D. O'Donnell, former plant accountant. Mr. O'Donnell, a native of Vincennes, Ind., received early public utilities experience working for the Vincennes Power Co. and later with Arthur Andersen & Co., auditors for the General System for many years. Prior to joining General of Florida in 1942, he did auditing work for the Indiana Public Service Commission.

W. A. Brown Retires From General of Florida

General Telephone Co. of Florida's secretary and treasurer, Walter A. Brown, has retired from active association with the telephone industry following 33 years with the company.

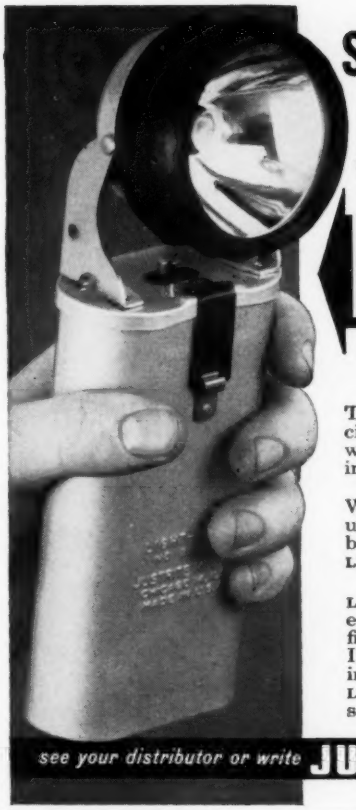
Prior to his joining General of Florida in 1925 (then Peninsular Telephone Co.) he worked for the Central Home organization which operated Kentucky telephone exchanges (later purchased by Southern Bell). While with Central Home, he was employed as a traveling auditor and later became general auditor.

Mr. Brown was born in New Albany, Ind., graduated from New Albany High School and later attended business college there.

His first job was with the National Bank of Kentucky. Later, he held bookkeeping and accounting jobs with several wholesale companies and became associated with the national firm of Peaslee-Gaulbert Co. in Louisville.

After leaving Peaslee-Gaulbert, he joined the Central Home organization and from there moved to Florida to join Peninsular Telephone Co.

He began with Peninsular as assist-



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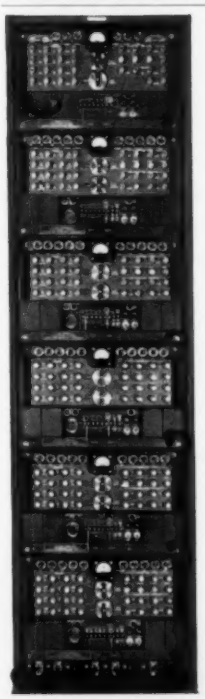

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These systems provide a voice-channel flat within 1 db from 300 to 3500 cycles, for each 4 kc of bandwidth occupied. Each channel is equipped with hybrid, signalling, and dialling circuits for all the standard 2-wire and 4-wire loop options.

The basic unit provides an order-wire and 4 carrier-derived channels. These units can be stacked in groups of 2, 3, 4 or 5 by means of a group modem to provide 9, 14, 19 or 24 channels. Full flexibility is provided for dropping and inserting channel groups at repeater and terminal points. Moderate lengths of 4-wire cable or open-wire line may be inserted between the multiplex equipment and the radio terminals.

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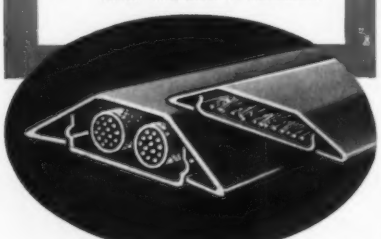

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ant general auditor. He became progressively general auditor, treasurer and general auditor, and following the company's name change to General Telephone Co. of Florida, he became secretary and treasurer.

He is a member of the board of directors of the Florida Telephone Association and a member of the Accounting Committee of the United States Independent Telephone Association.

He also belongs to the Independent Telephone Pioneer Association and the W. G. Brorein Council, David Laird Chapter of the Telephone Pioneers of America.

He is a life member of the latter organization.

Mexican Government Builds Microwave Network

The Mexican government is currently completing a large-scale microwave telegraph and telephone system as a complement to telephone and telegraph standard radio communication. The cost of this system so far has been 3.2 million dollars.

Completed is a network with principal terminals in Mexico City and Guadalajara. Finishing touches are being put on the southeastern network, linking Mexico City with the Isthmus of Tehuantepec whose main terminal is located at Coatzacoalcos. It will be extended in the near future to Morida, Yucatan.

The new system is equipped with facilities for transmission of 12 communications via Morse code, teletype or "telex" service on each channel. The network has a capacity equivalent of 600 telephone lines.

Farm Telephones Increase

There were 2,684,000 farms in the United States with telephone service in 1957, the Department of Agriculture reports.

This represents an increase of 70 per cent since 1940, 24 per cent since 1950, and 6 per cent since 1955.

Obituary

RAY A. MILLER, field sales representative for the Whitney Blake Co., died on July 27 in Philadelpha, Pa.

Mr. Miller joined the Whitney Blake sales department in 1938, started the Philadelphia sales office in 1948 and was active in sales work up to the time of his death. His territory included southern New Jersey, Maryland, Delaware and eastern Pennsylvania.

In speaking of Mr. Miller, John Brown Cook, president of Whitney Blake Co., expressed deep regret over his passing and praised his long, loyal service to the company.

R. A. MILLER

"Those of us who knew Ray," said Mr. Cook, "feel a deep personal loss, but are grateful to have had the privilege of knowing a man so kindly, so thoughtful and so loyal in his friendships."

He is survived by his wife, A. Lucile Miller, a son, Richard, and a daughter, Mrs. Barbara Brown.

Dress-up Thoughts

"Style is the dress up of thoughts." —EARL OF CHESTERFIELD.

An American Creed

I do not choose to be a common man. It is my right to be uncommon if I can. I seek opportunity—not security. I do not wish to be a kept citizen, humbled, dulled, by having the state look after me.

I want to take the calculated risk; to dream and to build; to fail or succeed. I refuse to barter incentive for a dole. I prefer the challenges of life to the guaranteed existence; the thrill of fulfillment to the state calm of Utopia.

I will not trade freedom for beneficence, nor my dignity for a handout. I will never cower before any master nor bend to any threat. It is my heritage to stand erect, proud and unafraid; to think and act for myself; enjoy the benefits of my creation, and to face the world boldly and say: . . . this I have done—Anonymous —*Monument Builder News*, March, 1958.

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New convenience, simplicity for intermittent or continuous measurement of incident or reflected power is available with Sierra 164 series Power Monitors. Direct reading, accurate within ±5%, high directivity, low VSWR. Four plug-ins offer 1, 5, 10 and 50 watts full scale, 25 MC to 1,000 MC. Two additional plug-ins offer 10, 50, 100 and 500 watts full scale. A further plug-in covers 10 MC to 75 MC, 50, 100, 500, 1,000 watts full scale. No auxiliary power needed; power flow direction reversed by control knob at top of plug-in.

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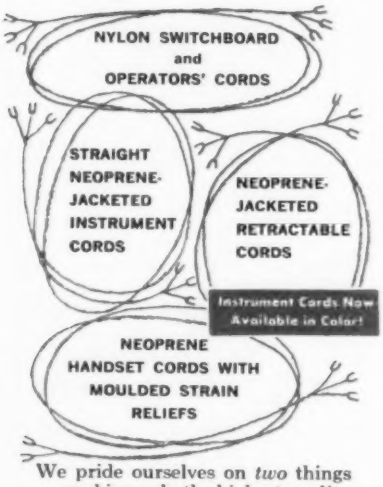
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BURIED WIRE AND CABLE CONSTRUCTION

Continued from page 24

task of adding pedestals to an existing buried lead at a later date.

Loading of Buried Facilities

Pedestals are available for loading purposes and should be located at the usual 6,000-foot spacing on all buried leads, beginning 3,000 feet from the central office. The same pedestal may be used on both distribution and loading in many situations. Individually potted H-88 loading coils are available for use on either buried wire or cable. These coils come equipped with flexible wire leads for use in connecting them between the terminal blocks in the pedestal. It has been determined, by REA, that the dielectric strength of loading coils will be approximately equal to that of buried cable. Protection is therefore not considered necessary. Where more than 22 pairs are to be loaded, a buried load case will usually be most satisfactory.

REA Requirements

REA states that for the present it will consider for approval the construction of either entire systems or parts of a system on a buried plant basis only after a complete and thorough engineering study and economic analysis have been prepared by the system engineer. The engineering study and economic analysis must show the following:

(1) That project area conditions are favorable for the construction of buried plant.

(2) That state and local highway and road authorities will give permission for the utilization of highway and road rights-of-way for buried plant.

(3) That attention has been given to any problems encountered in the area requiring special measures in the design such as:

(a) Gopher and termite infestations.

(b) High lightning incidence and high earth resistivity.

(4) That special care and attention have been given to forecasting the market for telephone service in the area in recognition of the decreased flexibility in buried plant and the higher costs of reinforcement at a later date.

(5) That the initial cost of the system design, based on buried plant proposed, will be less or closely comparable to the initial cost of the most economical system design utilizing other conventional methods of telephone construction.

(6) That there is a definite economical advantage in the annual cost of the proposed buried plant design compared with the design utilizing other conventional methods of construction.

Flood Areas

In some sections of the United States, the flooding of large areas must be considered in the design of buried plant. Flooding may also prove a serious problem on parts of systems not included in a general flood area. This could be in river bottoms and valleys that drain slowly after periods of heavy rainfall. In general, the pedestal terminal, housing, load coils and splicing points should be located 3 or 4 feet above ground level. Floods of greater depth would permit water to enter cables and probably cause trouble eventually. As a rule, the cable plant will be self-restoring after the flood recedes in a properly designed plant. In some severe flood areas, however, it may be necessary to seal the openings of the cable with a cold setting resin at the points where it enters and leaves the pedestals.

Transmission Characteristics

From the standpoint of transmission design, procedures for buried facilities do not differ from those specified for aerial cable. The nominal capacitance of buried cable (furnished under REA's specifications) is 0.083 microfarad per mile for all sizes and gauges.

Circuits having a dc conductor loop resistance up to 1,000 ohms can be served with equipment purchased under the REA's central office specifications without the use of long-line adapters. For subscriber's loops of 1,000 to 1,400 ohms, the use of long-line adapters will depend on each individual manufacturer's specifications. On loops exceeding 1,400 ohms, long-line adapters will always be required with presently manufactured central office equipment.

Principal Uses of Buried Plant

The principal economic advantages in the use of buried plant are definitely in the rural areas. Plowing operations that make this type of plant a good investment can best be performed far from pavements and various underground utilities. Distances in rural areas are also greater and the circuit requirements are generally low enough to be taken care of in a single cable that can be plowed in. Distances, too, are usually greater in rural areas which makes the savings really attractive.

Buried facilities, however, are being installed in some new urban housing developments. These systems have been installed prior to the paving of streets and the placing of sidewalks. In some instances, main cables have been plowed in and pedestals have been installed in alleys or easements, as re-

quired, to reduce the length of buried service cables to residences in the block. In some cases these service cables have been placed to good advantage by the use of small trenching machines. To date, it is understood that some of the early trial installations indicate a real economy in selected new housing developments.

(To Be Continued Next Week)

Book Reviews

"ELECTRON TUBE CIRCUITS," by Samuel Seely, professor of electrical engineering, Case Institute of Technology; 695 pages; $10.50.

This is the second edition of a popular book which was first written in 1950. The new edition has been extensively rewritten and has many more pages. This is a college training text, but it can be of great value to the non-college man, because the physical explanation of each circuit is given as well as a mathematical analysis.

The most complicated electronic circuit ever devised is made up of a lot of smaller circuits, or building blocks. If the reader can understand how each of these sub-circuits work, he can understand the complete mechanism. This book is the story of these building blocks.

If the reader is puzzled when he reads about feedback, counting, integrating, or switching circuits, or anyone of a thousand other things, he can look it up in this book as if it were a dictionary. He will then get the answer in a sample circuit, which he, generally, will be able to understand, even if he can't figure out the mathematics.

This reviewer has used the first edition of this book for a number of years and can personally highly recommend the second edition as a necessary part of an electronic library. It is available from TELEPHONY.

•

"MANAGEMENT FOR ENGINEERS," by Roger C. Heimer; 453 pages; $6.75.

Men in executive positions have often complained that while they can obtain good engineers, as such, they are hard-pressed to find engineers whom they can promote to managerial positions. Yet, management has a growing need for engineers.

The engineer has been trained to look at things objectively and to make decisions backed by hard, basic, incontrovertible facts. Management, on the other hand, must make decisions which are subjective, d e c i s i o n s which are concerned with human beings rather than the laws of physics. Many engineers find that their progress is blocked because they do not know enough about economics or accounting, and this book sets out to correct this situation.

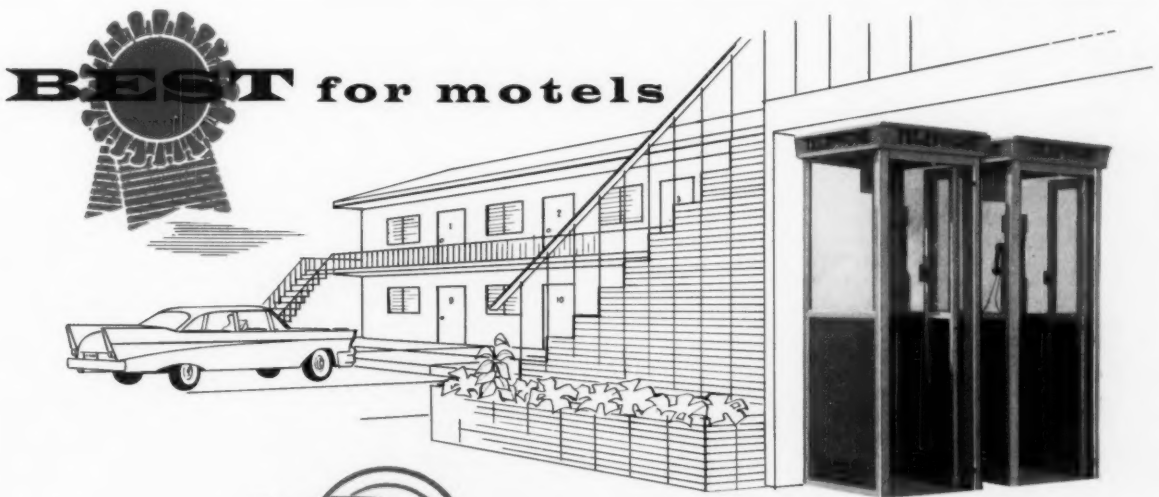
It aims to acquaint the young engineer with (1) The costs entering into production; (2) The basic financial transactions of the business and the sources of funds; (3) The organizational structure and the concepts of authority, responsibility, and the coordination of activities; and (4) The duty of the engineer-manager to contribute to the high-level decision-making process and when to make decisions himself within his own area.

This book is available from TELEPHONY.

•

"VACUUM TUBE RECTIFIERS," by A. Schure; 78 pages; 5½ inch x 8½ inch paper cover; $1.50.

This is a single subject book, one of an electronic technology series. It covers the basic principles of half-wave and full-wave rectifiers in single phase circuits. Circuits are given for such variations as bridge rectifiers, and doubler, tripler, and quadrupler circuits. An interesting section on polyphase rectifiers such as three-phase



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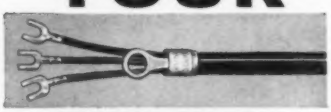

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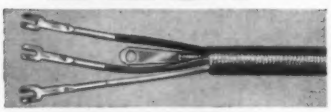

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half-wave double-wye (six-phase) rectifiers is included.

A section on output filters and design data is in the last part of the book.

It is probable that a lot of telephone power men do their job without ever really understanding how this vital part of the plant operates. This could prove to be a useful book, not only for the working telephone man, but for the man in training as well.

This book may be ordered from TELEPHONY.

•

"INDUSTRIAL CONTROL CIRCUITS," by Sidney Platt; 200 pages; 5½ inch x 8½ inch paper cover; $3.90.

The telephone man will probably never have a need for the circuit of the pill-counting machine which is given in this book, but he may get a good inkling of the kind of circuits that electronic switching is bringing to his trade. Some of the electronic techniques used in industry have run ahead of the telephone business, and now some of the circuits used in machinery control are finding their way into the telephone plant.

The first part of this book, for instance, shows a number of timing circuits for relays which have electronic features. The magnetic amplifier which is now used in some telephone power supplies, and the rotary amplifier (the amplidyne), are explained and their applications are also shown.

While the telephone man, unless he intends to fix the building elevator, will not find much use for the sections on controls for motors and welding machines, this book will give him a good picture of what he is going to have some day in telephone switching equipment. This book may be especially recommended because it covers an important electronic field which is usually not found in either telephone or radio books.

It is written for technicians, not engineers, and is a good bet for the man who wants to keep himself up-to-date on electronics.

This book is available from TELEPHONY.

Reviews by Harold B. McKay, TELEPHONY's Electronics Editor.

London, California Hold Trans-Atlantic Conference

"This is London. We are receiving you fine. Carry on!"

With these words the first large scale civilian trans-Atlantic telephone conference got under way between two groups of about 100 people in Burbank, Cal. and London, England.

The unique conference between the Burbank rotary club and the Brickstone rotary club followed months of planning and was made possible by conference equipment developed by the Altec Lansing Corp. of Anaheim, Cal.

The equipment amplifies the low-voltage telephone line signals so that groups of any size gathered in one room can participate in a two-way conversation.

This is believed to be the biggest

Key engineers who supervised London-Burbank telephone conference are shown with special Altec Lansing Corp. equipment. Left to right: Merle Jones and Harold Dydell of Pacific Telephone & Telegraph Co. and Dr. John K. Hilliard of Altec.

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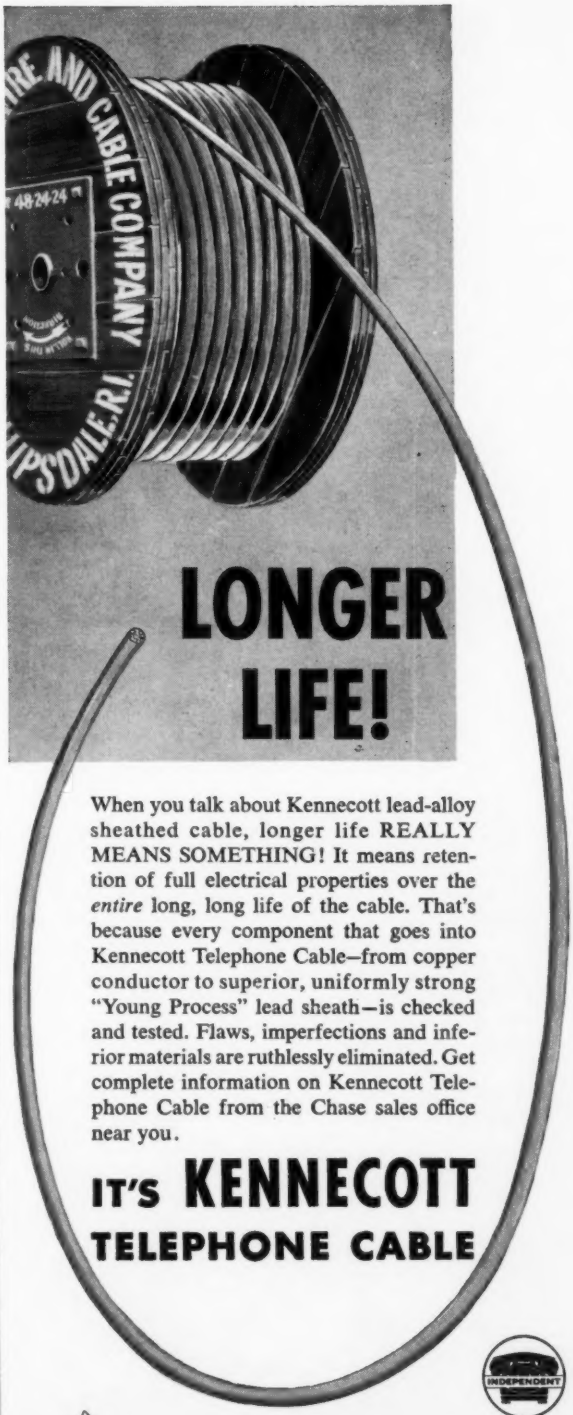

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inter-continental conference ever held —in terms of numbers of persons participating. Reception at the Burbank end of the conversation was nearly perfect, with two minor fade-out interruptions.

Reports indicate that similar conditions prevailed in London. The ten-minute talk took place at 12:00 p.m., Pacific Standard Time in Cal. and 8:00 p.m., London time, on June 17.

The new product developed by Altec Lansing, manufacturers of commercial sound and home high fidelity equipment, is a distant talking, hands-off conference system which utilizes telephone lines for transmission. Participants at this end also used Altec's new cardioid condenser microphone.

Similar units are being used by the Navy in Washington to transmit immediate verbal orders to Honolulu, Wake and Midway and enable groups of senior officers at these bases to confer with Washington.

Arrangements for the call here were made by Pacific Telephone & Telegraph Co. who cooperated on the design of the unit with Altec.

Pacific T&T officials indicated that national sales meetings and similar affairs may, with the help of the new equipment, be held without the expense of calling in representatives from all over the nation.

Altec's team of audio engineers who developed the telephone conference system and serveral other units which improve telephone service was headed by Dr. John K. Hilliard, vice president and director of advanced engineering.

Lenkurt Appoints Bowser, Arnold, General Managers

Lenkurt Electric Co. has announced the appointment of Alden P. Bowser as general manager of the international division, and Burnie L. Arnold as general sales manager of the commercial products division.

Mr. Bowser will be responsible for the communications company's customers outside the U.S.A., Canada, and Mexico. He continues as vice president of the subsidiary Lenkurt International Corp., a position he has held during the past year while serving as the parent company's export manager.

Mr. Arnold previously headed sales activity in Lenkurt's engineer, furnish and install department, where he is succeeded by Marion C. Royalty.

Mr. Bowser joined Lenkurt in 1954 and has held several sales management positions including a year heading the Geneva, Switzerland, office. His communications experience includes 12 years with the Civil Aeronautics Administration, with four years as deputy chief of the electronics branch. He holds the B.S.E.E. and M.S.E.E. degrees from Massachusetts Institute of Technology.

A. P. BOWSER

Mr. Arnold also has held various sales engineering and executive positions since joining Lenkurt in 1956, after five years with Automatic Electric Sales Corp. as carrier and radio sales division manager. Previously he was with General Telephone Co. of California for four years and with California Inter-State Telephone Co. eight years. He is a member of the

Answers to Questions On Page 56

(1) The operator will proceed in the usual manner, and as an overlap, will refer the matter to the chief operator.

(2) The operator should challenge before releasing the called line and before she releases the circuit and trunk.

(3) Say, "Would you prefer to place your call again or shall I leave word for Mr. (called party) to call me?"

(4) Yes, leave word, clear the circuit, cancel the ticket, and say to the calling party, "I'll call you when Mr. (called party) reports. However, if he does not report, you may wish to place your call again later today.

(5) The operator will say, "The calling party will call later." The ticket is then cancelled.

B. L. ARNOLD

American Institute of Electrical Engineers and the Independent Telephone Pioneers.

IN THE NATION'S CAPITAL

Continued from page 18

business through new intermediary private-owned investment corporations which will be chartered under federal law. This has nothing to do with rural telephone or rural electrification since any kind of legitimate small business, including family or proprietory business, would be eligible. But, the interest rate would be presumably at a level comparable with the going interest rate for such loans by commercial investment companies. The idea simply would be to make loans available to small firms which otherwise might have difficulty getting loans at all through commercial banks or other conventional lending agencies.

Now, comes the new small business *tax* relief. This 260-million-dollar program was included in a compromise bill providing for a technical overhaul of income tax law. In addition to providing a six-point program of "fringe benefit" tax relief for small business, the measure would close tax loopholes for some taxpayers and provide new benefits for others. The measure, a compromise between differing Senate and House versions, was assured of President Eisenhower's signature.

The tax relief program for small business would not change any tax rates. Its key provision would permit taxpayers to reduce taxable income by deducting a larger percentage of the cost of machinery and equipment for depreciation in the year of purchase. In addition to regular first-year depreciation, taxpayers would be permitted a first-year depreciation allow-

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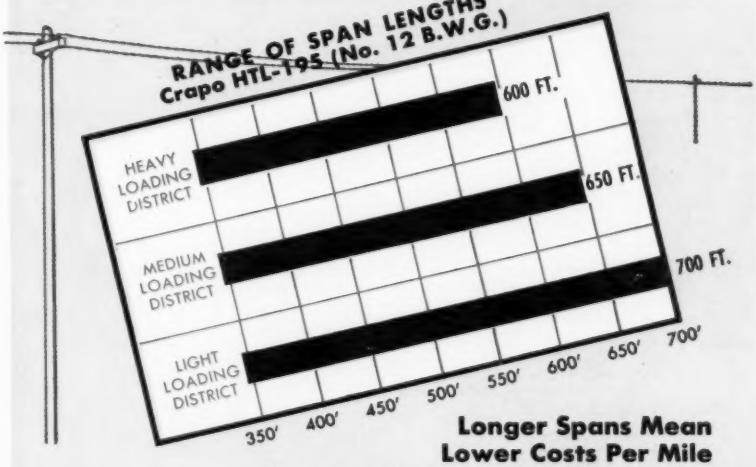

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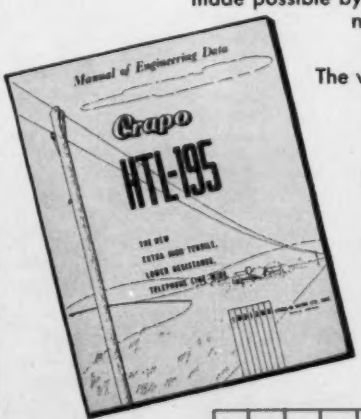

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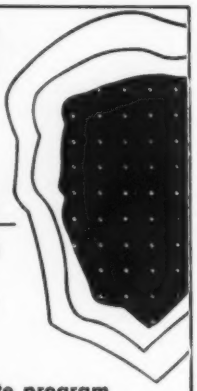

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ance equal to 20 per cent of the cost of investment outlays up to $10,000. In the case of joint returns filed by husband and wife, the allowance would apply to investments of up to $20,000. This would apply to all taxpayers with depreciable assets—including large and small business firms and farmers. The dollar limit on the benefit was designed to insure that most of the relief goes to smaller firms.

The program also provides for a big tax break for the new privately-owned investment corporations which will be chartered under the small business loan law already mentioned. The tax legislation would exempt these small business investment corporations from paying any taxes on dividend income they receive from investments, regardless of whether they pay it out to their own stockholders. It also would permit these corporations to charge off their capital losses against ordinary income which is subject to a higher income tax rate.

The small business tax relief program also would:

(1) Enable heirs of small businesses to save the business from forced liquidation resulting from estate taxes. It would allow estate taxes resulting from ownership in closely-held businesses under certain circumstances to be paid in 10 annual installments.

(2) Encourage investment in small business by providing more liberal deductions for losses suffered by individual investors or partnerships. The bill would raise to $25,000—or $50,000 for joint returns—the present $1,000 limitation on ordinary loss deduction from such stock losses. Losses above that amount would remain subject to treatment as capital losses.

(3) Allow businesses—large or small—to get retroactive tax refunds for three previous years as a result of operating losses. Under present law a loss may be carried back only to the two preceding taxable years. Losses not offset by prior taxable income could be carried forward, as at present.

(4) Increase to $100,000 the present $60,000 credit offset against penalty taxes for accumulating earnings in a business instead of distributing them to stockholders who would be liable for income taxes.

REA Reorganization Unlikely

As Congress went into what would probably be the last week of its session, the chances were slight that REA co-ops and their supporters in Congress could rush through Congress a bill designed to give the REA administrator full authority over the REA lending program. The so-called Price-Humphrey Bill would have nullified an order by Secretary of Agriculture Benson last summer, directing that all REA loans over $500,000 be reviewed by Kenneth Scott, director of Agricultural Credit Services. Although REA Administrator Hamil denied that the order had resulted in any reversal of his own decisions, co-ops feared the Benson order was aimed at eventual restriction of REA's lending authority. The national REA co-op association, National Rural Electric Cooperative Association (NRECA), in particular has been busy lobbying for the measure with arguments to farmer co-ops that Benson's veto power over large loans was or could be used to stifle generating and transmission loans.

The House was expected to consider, before adjournment, the Price-Humphrey Bill under a special procedure requiring a two-thirds vote for consideration. Its passage by the House, however, is not expected to make any difference in the outcome of the REA legislation. A Senate committee has held hearings on the bill, but it had not yet reported it to the Senate. At this late date, it is not likely to do so. Finally passage of the bill by Congress would more than likely encounter a sure presidential veto. At this writing, the bill is probably dead this year, but is certain to be revived next year. It is one of those perennial issues which gives NRECA bargaining power in Congress and justifies its appeal for co-op membership on grounds that it protects co-op interest in Washington.

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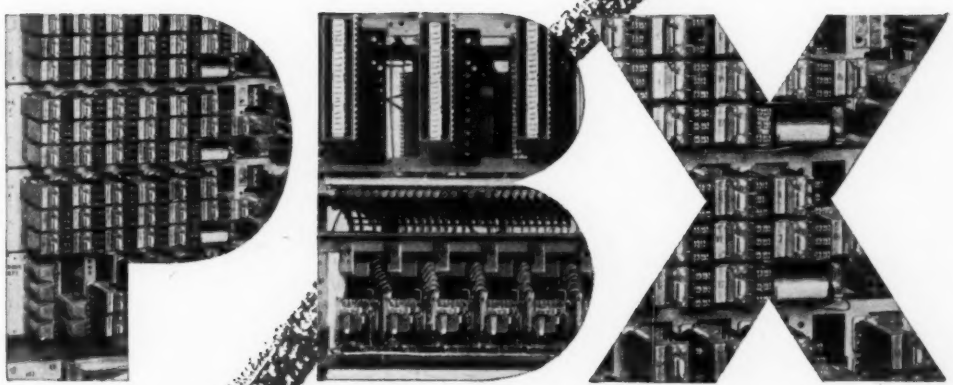

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